Tanta University

Department: Production and Mechanical Design
Total Marks: 100 Marks

Faculty of Engineering

Course Title: Design tools and production aids	Course Code: MPD4233	Year: 4th
Date: Jun 2014 (Second term)	Allowed time: 3 hrs	No. of Pages: (1)

Remarks: (answer the following questions... assume any missing data... answers should be supported by sketches) اجب عن الاسئلة الاتية –افرض اي بيانات غير موجودة- يجب ان تكون الاجابة مدعمة بالاسكتشات

Problem number (1) (15 Marks)

Wrie short notes on:

a) Design flat form tool in an analytical method at zero rake angles, choose a suitable material, and corresponding parameters? (10 Marks)

b) And using a graphical method for a positive rake angle? (5 Marks)

Problem number (2) (35 Marks)

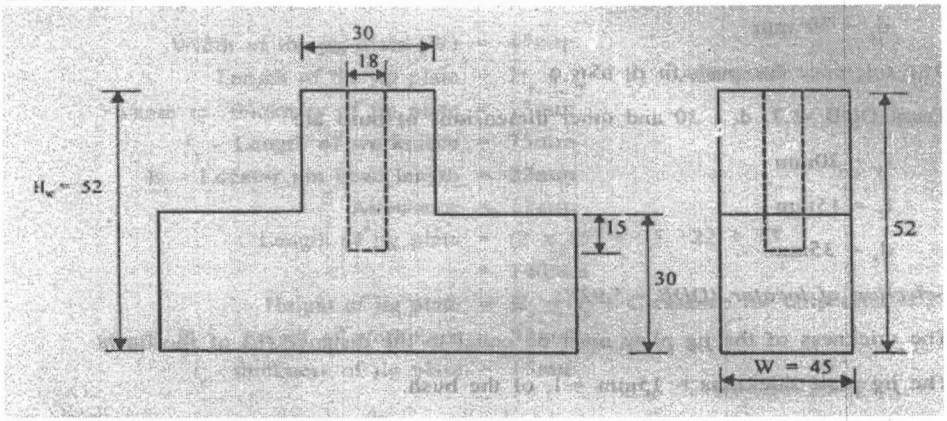
Write short notes on:

a) Main elements of jig and fixture? (5 Marks)

b) Pin and Button locator? (5 Marks)

c) The function of any clamping device is that of applying and maintaining sufficient counteracting holding force to a workpiece to withstand all tooling forces,(Clamping and positioning).? (10 Marks)

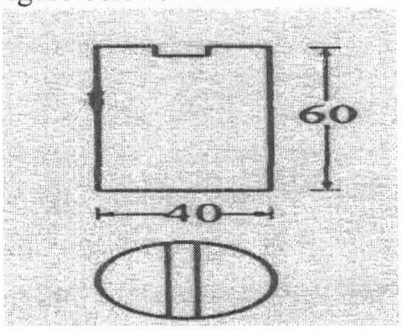
d) Design and draw a channel jig for mild steel component as shown in Figure below to drill the hole diameter of 18 mm. (15 Marks)



Problem number (3) (20 Marks)

a) Write short notes on: fixture of rectangular and circular components? (5 Marks)

b) For cutting the slot in batch production. Design a milling fixture to cut a slot 3 x 3 mm in a mild steel component as shown in Figure below. (15 Marks)



Problem number (4) (30 Marks)

Write short notes on:

a) Types of clearance should be studied before design fixture of shearing? (5Marks)

b) Explosive forming and Die Swell? (5 Marks)

c) Redrawing types (direct-indirect)? (5 Marks)

d) In extrusion: Explain how can you get hollow shapes? (5 Marks)

e) The injection molding machine (injection unit and cycle- functions of clamping unit? (10 Marks)

٢٠١٤/٦/٩

Tanta University	Date:2013/2014
Facultyof Engineering	Timeallowed:3 hrs
Department of Mechanical Engineering	Full Mark: 75 Marks
Year: 4year Mechanical production	Subject: Final Exam.
Final Exam: 2 Pages	Name: Jigs & fixtures
Academic Number:	

Answer as much as you can

(20 marks)

1-a-A. It's required to design A fixture For Helping in machining of 20 blocks of 4x5x5 cm to be of the same dimensions as final machining step. Draw a schematic drawing indicating the necessary components.

1-b-B.It's required to design A fixture For Helping in machining of 20 cylinders of 4 cm diameter to be of the same height of 5 cm as final machining step. Draw a schematic drawing indicating the necessary components.

(15 Marks)

2-Using comparativeanalysis for the following tooling problem a total of 850 flange plates require four holes accuratelydrilled 90 degrees apart to mate with a connector value. Which of the listed alternatives isthe most economically desirable?

a. Have a machinist who earns $15.00 per hourly out and drill each part at a rate of 2 minutesper parts.

b. Use a template jig, capable of producing 50parts per hour and costing $20.00, in the production department, where an operator earns$7.50 per hour.

c. Use a duplex jig, which costs $35.50 and can produce a part every 30 seconds, in the productiondepartment, where an operator earns $5.50per hour.

(20 Marks)

3-a- Four equispaced through holes have to be drilled radials in a disc, (like rotor of radial piston pump) as shown in Fig. (a) A jig is to be designed for batch production of such discs. (O. D. =100 mm, I. D. = 50 mm, Thick. = 65 mm & Hole D.= 45 mm)

b- A through rectangular section slot has to be cut on a rod as shown in Fig. (b). A fixture or jig is to be designed for cutting the slot in batch production to be machined on a general purpose lath. The shaft length = 350 mm., O.D. = 65 mm. & rectangular section slot is of 12mm in depth & 15 mm in width.

Design the suitable jig or fixture for the required processes in (a) &(b).

Tanta University | Department: Production Engineering and Design | Faculty of Engineering

Total Marks: 85 Marks

Course Title: Operations Research	Course Code:	Year: 4
Date: Jan 201٤ (Second term)	Allowed time: 3 hrs	No. of Pages: (2)

Remarks: (answer the following questions… assume any missing data… answers should be supported by clear estimations , tables, sketches…etc)

Q1: A factory manufactures a product each unit of which consists of 5 units of part A and 4 units of part B. the two parts A and B require different raw materials of which 120 units and 240 units respectively are available. These parts can be manufactured by three methods. Raw material requirements per production run and the number of units for each part produced are given in Table 1. Determine the number of production runs for each method so as to maximize the total number of complete units of the final product. (15^0)

Table 1	Input per run (units)		Output per run (units)	
method	Raw material 1	Raw material 2	*Part A*	*Part B*
1	**7**	**5**	**6**	**4**
2	**4**	**7**	**5**	**8**
3	**2**	**9**	**7**	**3**

Q2: Determine the feasible solution of variables with using M technique: (15^0)

Minimize z=4x1+x2

3x1+x2 >=3

4x1+3x2 >= 6

X1+2x2<=4

X1,X2>=0

Q3: Distinguish and discuss these cases graphically and mathematically. (25^0)

Maximize Z=3X1+9X2	Maximize Z=3X1+2X2	Maximize Z=2X1+4X2	Maximize Z=2X1+X2	Maximize Z=3X1+2X2
X1+4X2<=8 X1+2X2<=4 X1,X2>=0	4X1+3X2<=12 4X1+X2<=8 4X1-X2<=8 X1,x2>=0	X1+2X2<=5 X1+X2<=4 X1,X2>=0	X1-X2<=10 2X1 <=40 X1,X2>=0	2X1+X2<=2 3X1+4X2>=12 X1,X2>=0

Q4: A company has factories at four different places, which supply warehouses A,B,C,D AND E. Monthly factory capacities are 220, 180, 150 and 280 units respectively. Monthly warehouse requirements are 110, 190, 120, 230 and 160 units respectively. Unit's profits are given in L.E. Determine the optimum transportation to maximize profits. (15^0)

To / From	A	B	C	D	E
1	13	14	11	8	12
2	14	9	17	6	10
3	13	11	12	17	15
4	10	10	13	18	11

Q5: Five wagons are available t stations 1,2,3,4 and 5. These are required at five stations I, II, III, IV and V. the mileages between various stations are given by the table indicated. How should the wagons be transported (assign) so as to minimize the total mileage covered? (15^0)

	I	II	III	IV	V
1	10	5	9	18	11
2	3	9	6	12	4
3	3	2	4	4	5
4	1	9	12	17	5
5	11	6	14	19	10

مع تمنياتى بالتوفيق ١.د.م/ احمد القصاص

٢٠١٤/٦/١٨ إنتاج ٤

جامعة طنطا
كلية الهندسة
قسم هندسة الإنتاج والتصميم الميكانيكي

المادة/ مقرر اختيارى(٥) الجودة الشاملة
(MPD42**)
الفرقة الرابعة (إنتاج)

بسم الله الرحمن الرحيم
التاريخ : ٢٠١٤/٦/١٨
الزمن : ٣ ساعات

أجب عن الأسئلة الآتية:- (٨٥ درجة)

السؤال الأول: -(٣٠ درجة)

١- ما هو المشروع ؟- اكتب نبذة مختصرة عن المراحل التى يمر بها المشروع المقترح للاستثمار.
٢- ما المقصود بكل من :- (٥ درجات)
دليل الربحية - مرونة الطلب السعرية
٣- من دراسة الجدوى التسويقية والجدوى الفنية للمشروع تبين ان لكل مشروع تكاليف وعوائد تتحقق بعد تنفيذ المشروع – اشرح بالتفصيل هذه التكاليف. (٥ درجات)
٤- تكلم بالتفصيل عن عناصر التصنيع. (٥ درجات)
٥- ما هي أهم الجوانب الاجتماعية التي تهم القائم بدراسة الجدوى لأي مشروع؟ (٥ درجات)
٦- ما هى فوائد اجراء التقييم البيئى؟- وما هى خطوات معالجة الاثار البيئية للمشروع. (٥ درجات)

السؤال الثانى: (١٥ درجة)

١- يمكن تقسيم المصنع على حسب طرق عمليات الانتاج والتخطيط الى ثلاثة أقسام رئيسية
اكتب نبذة مختصرة عن هذه الأقسام. (٥ درجات)
٢- تكلم عن أهم:- (٥ درجات)
(أ)- العوامل المؤثرة في حجم مرونة الطلب.
(ب)- العوامل التى يترتب عليها نقصان أو زيادة العرض.
٣- ما هي العوامل التي تؤخذ في الاعتبار عند اختيار موقع مصنع جديد. (٥ درجات)

السؤال الثالث: -(١٥ درجة)

١- ما هو المخزون؟ - لماذا نحتفظ بالمخزون. (٥ درجات)
٢- ما أهمية المفاضلة بين المشروعات مع شرح لمراحل المفاضلة بين المشروعات. (٥ درجات)
٣- اذكر أهم نقاط الاختلاف بين معايير الربحية التجارية ومعايير الربحية القومية. (٥ درجات)

السؤال الرابع: -(٢٥ درجة)

- ما المقصود بالجودة - اشرح باختصار مراحل تطور الرقابة على الجودة. (٥ درجات)
- تكلم عن أهم مزايا وعيوب الجودة الشاملة. (٥ درجات)
- تكلم باختصار عن أهم مراحل تطبيق نظام ادارة الجودة الشاملة. (٥ درجات)
- اكتب نبذة مختصرة عن وظائف الإدارة الخمسة. (٥ درجات)
- اكتب نبذة مختصرة عن دراسة جدوى مشروع استثماري. (٥ درجات)

مع أطيب التمنيات بالنجاح
أ.د/عبد الفتاح مصطفى خورشد