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WEST COAST FET COLLEGE
WESKUS VOO KOLLEGE

ASSESSMENT COVER PAGE : ERD

SUBJECT: Fitting & Machining LEVEL: 3

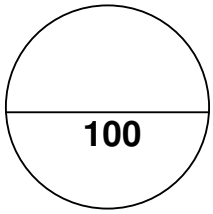
DATE: September 2017

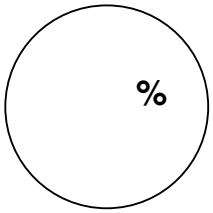
EXAMINER: D. Cronje

NAME OF MODERATOR: Focus Group

Student Surname		Name	
ID. Number		Group	

Topic and outcomes covered	**Topic 1- 10**
Duration	**One (2) Hour**
Evidence Required	**Written test script**
Instrument	**Internal Test**





Rating Scale	Remark	Rating
4	Highly competent	80 - 100
3	Competent	50 - 79
2	Not yet Competent	40 - 49
1	Not achieved	0 - 39

SIGNATURES:

Student declaration: I declare that the evidence provided is my own work.

STUDENT: _____ Date: _____

Revision Date: _____

Indicate which questions you found difficult (tick √)

1	2	3	4	5	6	7	8	Total
9	10							100

LECTURER: _____ Date: _____

COMMENT: _____

Post moderation _____

College moderation: _____ Date _____

External moderation _____ Date _____

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INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Questions may be answered in any order, but subsections of questions must be kept together.
5. Show ALL the intermediate steps.
6. ALL the formulae used must be written down.
7. Questions must be answered in BLUE or BLACK ink.
8. Write neatly and legibly.

QUESTION 1 : (BEARINGS) (16 Marks)

1.1. Determine if the following statements are **true** or **false**:

1.1.1. Solid bearings are used in places where little wear is expected

1.1.2. A bush is an independent thin-walled bearing that is pressed into place.

1.1.3. Split bearings cannot be used on engine crankshafts.

1.1.4. The material "solid bronze" are suitable for the manufacturing of bearings carrying high load and low speed .

1.1.5. Thrust ball bearings are designed for applications where only thrust (axial) force occurs.

[5 Marks]

1.2. You were appointed as a maintenance fitter at company XYZ and your main task is to check and maintain the bearings of the machinery on a regular basis. On your first inspection you have noticed that most of the **plain bearings** generate excessive heat. Name five (5) possible reasons or causes for this overheating problem?

[5 Marks]

1.3. Name two methods of mounting anti-friction by the application of heat?

[2 Marks]

1.4. What is meant by the following terms:

1.4.1 Compatibility (Explain term)

1.4.2 Conformability (Explain term)

[4 Marks]

QUESTION 2 : (COUPLINGS) (14 Marks)

2.1. Determine if the following statements are **true** or **false**:

2.1.1. Rigid couplings have the ability to compensate for misalignment.

2.1.2. Marine couplings cannot withstand high torques and thrusts.

2.1.3. Oldham couplings is made of three (3) separate pieces of which two are flanges.

[3 Marks]

2.2. Name three types of misalignments of couplings.

[3 Marks]

2.3. Mention four faults that can result from careless fitting or faulty alignment in a coupling.

[4 Marks]

2.4. Explain the following:

2.4.1. What is a jacking bolt used for on the foot of a motor?

2.4.2. What is a dowel pin used for on the foot of a motor?

2.4.3. What is meant by “motor rock” ?

[4 Marks]

QUESTION 3: (BRAKES AND CLUTCHES) (8 Marks)

Name 2 advantages of each of the following brake systems:

3.1. Disk brakes

3.2. Drum brakes

3.3. Thruster brakes

[6 Marks]

3.5 Name two faults which will normally occur with clutches and brakes?

[2 Marks]

QUESTION 4 : (V-BELT DRIVES) (7 Marks)

4.1 Your manager has designed a machine which includes a gearbox connected to a motor. After the costing was done, its seems too expensive to manufacture. You are his assistant and think that a V-belt system will be better suited. Present 2 reasons to your manager why you would use a V-belt drive system instead of a gear drive system . [2 Marks]

4.2 Make a drawing of the above mentioned pulley system including the following labels:

PCD, Jockey pulley, Direction of turn, driving pulley, Driven pulley

[5 Marks]

QUESTION 5 : (CHAIN DRIVES) (8 Marks)

5.1 List 5 advantages of chain drives when compared to belt and gear drives. [5 Marks]

5.2 A malfunctioning chain drive can be identified by certain symptoms. List three symptoms.

[3 Marks]

QUESTION 6 : (GEAR DRIVES) (6 Marks)

6.1 You as a fitter has assembled and installed a gear drive (gearbox) on an assembly line of the factory. List 3 problems that can cause the gear system to fail and provide a suggested remedy.

[6 Marks]

QUESTION 7 : (PIPES AND PIPE-FITTINGS) (5 Marks)

7.1 Name 3 materials that can be used to seal **threaded** pipes. [3 Marks]

7.2 What is the meaning of the pipe schedule number [2 Marks]

QUESTION 8 : (VALVES) (5 Marks)

8.1 Valves are classified into 2 main groups. Name them . [2 Marks]

8.2 What is the main purposes of installing a valve in a pipe-line. Name 3 purposes [3 Marks]

QUESTION 9 : (LATHE) (15 Marks)

9.1 A mild steel workpiece with a 30 mm diameter must be turned using a tungsten tool bit. Calculate the spindle speed in rev/min that the lathe must be set at. (Given: $S=\pi \times d \times N$) . (Tungsten tip cutting speed = 50 m/min) [3 Marks]

9.2 What are the maximum and minimum sizes of an external diameter of 30 mm when the tolerance is ± 0,1mm? [2 Marks]

9.3 Choose a/an item/word from Column B that matches a description in column A. Write only the letter (A-G) next to the question number (9.3.1 – 9.3.4) in the answer book.

Column A	Column B
9.3.1 Prussian blue is used …….	A Check roughness of workpieces
9.3.2 Chatter marks on a workpiece are…..	B As lubricant to cut high carbon steel
9.3.3 Emulsified oil is used ……..	C To marks dimensions on workpieces
9.3.4 Scratch blocks are used to ….	D To check for interference between mating surfaces
	E Rib like markings on the workpiece
	F To lubricate the headstock
	G Add roughness to workpieces

[8 Marks]

9.4 Name TWO main types (NOT EXAMPLES) of cutting tools commonly used for the lathe

[2 Marks]

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QUESTION 10 : (MILLING MACHINE) (16 Marks)

10.1 A milling cutter is 25 mm in diameter and has four teeth. The cutting speed for the material is given at 4 meters per minute and the feed per tooth is 0,051. Calculate the feed in mm per minute? (Given: $S=\pi \times d \times N$; $f=ft \times T \times N$) [6 Marks]

10.2 A hexagon has to be milled on a blank workpiece. The indexing machine has the 24 hole plate installed. The plate has the following divisions.

Plate	Divisions						
24	2	3	4	6	8	12	24

Calculate the number of divisions required.

[3 Marks]

10.3 When clamping the workpiece on the vice, name FIVE factors that you need to consider.

[5 Marks]

10.4 Name the instrument that is used to centralise the spindle to the workpiece.

[2 Marks]

TOTAL: 100