

**UNIVERSITI KUALA LUMPUR  
MALAYSIAN INSTITUTE OF INDUSTRIAL TECHNOLOGY**

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**FINAL EXAMINATION  
JANUARY 2016 SEMESTER**

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**COURSE CODE : JFB 20803**  
**COURSE TITLE : PUMP AND COMPRESSOR SYSTEMS**  
**PROGRAMME LEVEL : BACHELOR**  
**DATE : 19 MAY 2016**  
**TIME : 2.30 PM – 5.30 PM**  
**DURATION : 3 HOURS**

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**INSTRUCTIONS TO CANDIDATES**

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1. Please read the instructions given in the question paper **CAREFULLY**.
  2. This question paper is printed on both sides of the paper.
  3. This question paper consists of **ONE (1)** section.
  4. Answer **FOUR (4)** questions only.
  5. Please write your answers on the answer booklet provided.
  6. Please answer all questions in English only.
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**THERE ARE 3 PAGES OF QUESTIONS EXCLUDING THIS PAGE.**

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**INSTRUCTION: Answer FOUR (4) questions only.**

**Please use the answer booklet provided.**

**Question 1**

(a) Pumps are divided into two categories, the positive displacement pump and the centrifugal pump. With the aid of diagram, explain the principles of both types of pump.

(10 marks)

(b) Summarize **FIVE (5)** differences between the positive displacement pump and the centrifugal pump.

(15 marks)

**Question 2**

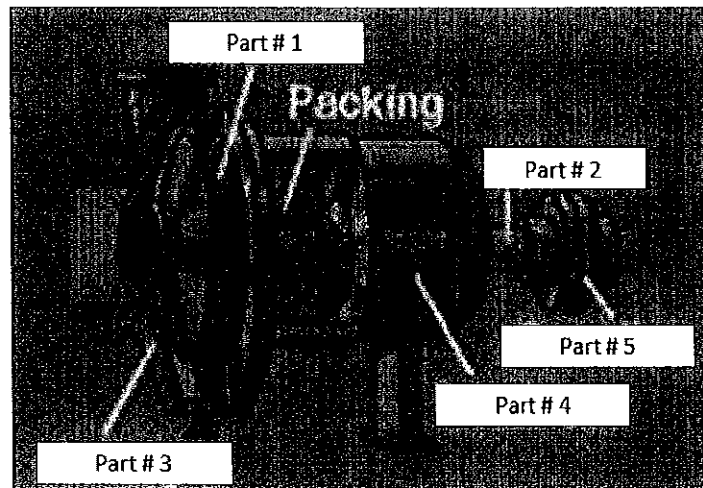


Figure 1: Centrifugal pump

Centrifugal pump as shown in Figure 1 are used to transport fluids by the conversion of rotational kinetic energy to the hydrodynamic energy of the fluid flow.

(a) List all **FIVE (5)** major components of centrifugal pump as shown in Figure 1.

(5 marks)

(b) Discuss **FIVE (5)** advantages and disadvantages associated with the centrifugal pump.

(10 marks)

(c) As the function of the pump is to transfer any liquid state material from a place to another place, propose **FIVE (5)** industries that use centrifugal pump.

(10 marks)

### Question 3

(a) Cavitation is the formation and subsequent collapse or implosion of vapor bubbles in the pump. When cavitation formed in a pump, its efficiency is reduced. If the pump operates under cavitating conditions for a long time, predict **FIVE (5)** problems that may occur to the pump.

(10 marks)

(b) Pumps and compressor are very important machineries in any industrial applications. Although the principle is almost the same, but the mechanism is different. Identify **FOUR (4)** differences between pumps and compressors mechanism.

(10 marks)

(c) Various compressors can be found in almost every industrial facility. Give **TWO (2)** application of compressor in industry and provide examples of the compressed gases for each application.

(5 marks)

### Question 4

(a) There are several types of air compressor. Describe each of the following based on the working mechanism.

- i. Centrifugal compressor
- ii. Reciprocating compressor
- iii. Rotary compressor

(15 marks)

(b) Identify **FIVE (5)** importance of filtration for compressed air system.

(10 marks)

**Question 5**

(a) The complete maintenance record of a pump is necessary and it is appears to be a valuable tool in determining the performance of the pump. As facility maintenance manager at your workplace, you are required to create a scheduled maintenance checklist for a fire pump. In your maintenance record, provide **FIVE (5)** basic components in a pump.

(15 marks)

(b) Analyze **FIVE (5)** possible causes and remedial actions for leaking of pump in the operation.

(10 marks)

**END OF EXAMINATION PAPER**