UTHM

Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022

COURSE NAME	:	ROLLING STOCKS TECHNOLOGIES
COURSE CODE	:	BNT 30103
PROGRAMME CODE	:	BNT
EXAMINATION DATE	:	JULY 2022
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWERS **ALL** QUESTIONS. 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK.** 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1   (a)   Rolling stock is referred as vehicle that uses railways as mode of transportation. There are many types of rolling stock in railways. List out **FOUR (4)** types of rolling stock that available at present railways operation.

(4 marks)

        (b)   In metro systems, automation refers to the process by which responsibility for operation management of the trains is transferred from the driver to the train control system. There are **FOUR (4)** types of Grade of Automation (GoA) particularly on Automatic Train Operation (ATO). Explain and relate them.

(10 marks)

        (b)   Railways standards is a document produced to define mandatory requirements to conceive, build and operate any railway system. Discuss the important of railways standard particularly on technical, safety, and economy.

(6 marks)

Q2   (a)   With aid of diagram, demonstrate **FIVE (5)** main components of a rolling stocks.

(5 marks)

        (b)   High speed train imposes greater demands on the design of a railway vehicle. Discover the ways in which the railway vehicle design has developed in order to overcome aerodynamic forces at these high speeds.

(5 marks)

        (c)   Explain traction system of rolling stocks. Differentiate **TWO (2)** types of traction system available in present technology.

(10 marks)

Q3   (a)   Computer Based Communication Control (CBTC) system offers faster, safer, and efficient operation in railways. This system allows trains to operate in "moving block" operation rather than "fix block" operation. Compare the advantages and disadvantages of these two train operations.

(10 marks)

        (b)   Vehicle on Board Controller (VOBC) is an important component in urban train system. Discuss main function of VOBC particularly on the onboard train operation.

(10 marks)

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Q4   (a)   Demonstrate the differences of motor bogies and non-motor bogies components and functions.

(12 marks)

(b)   The use of active suspensions is currently limited to only a few applications. Sketch and label an active suspension system.

(8 marks)

Q5   (a)   There are six degree of freedom of a vehicle motion. Analyse those motions associated with railways vehicle during operation.

(12 marks)

(b)   Braking systems compose slowing and stopping function in a rolling stock operation. Discover **FOUR (4)** types of braking system applied in urban train operation.

(8 marks)

-END OF QUESTIONS –

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