Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2021/2022

COURSE NAME	:	ENERGY SCENARIO & POLICY
COURSE CODE	:	MDL10203
PROGRAMME CODE	:	MDL
EXAMINATION DATE	:	JANUARY / FEBRUARY 2022
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER **FIVE (5)** QUESTIONS ONLY OUT OF **SIX (6)** QUESTIONS 2. THIS FINAL EXAMINATION IS A **ONLINE** ASSESSMENT AND CONDUCTED VIA **CLOSE BOOK**

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1 **(a)** Electrical energy is considered secondary energy.

(i) Define ' Secondary energy'.

(ii) Defferentiate between renewable and non-renewable electrical energy according to electrical energy sources.

(5 marks)

(b) World Energy Scenarios reports were developed by several institutions to explore and navigate what might happen in future energy. This report will support better quality in future energy. Write the main energy scenario drivers and current energy scenarios for each driver. (5 marks)

(c) Energy demand is expected to increase considerably in the coming years as the result of population growth and economic development. Analsye the comparison between Malaysia energy supply and demand according to Malaysia Energy Statistics Handbook which was published by Energy Commission in 2018.

(10 marks)

Q2 **(a)** The energy sectors in Malaysia is governed by several institutions. Differentiate their function and area of jurisdiction:

(i) Economic Planning Unit (EPU),

(ii) Ministry of Energy and Natural Resources (Kementerian Tenaga dan Sumber Asli (KeTSA).

(iii) Energy Commission, and

(iv) Malaysian Green Technology Corporation (GreenTech Malaysia) which formerly known as Malaysia Energy Centre

(8 marks)

(b) The Energy Commission building which was also known as the Diamond Building, is one the most energy-efficient building in Malaysia. The energy index of the building was reported to be only around 85 kWh/m^2 annually at 2800 hours of usage. This accounts for 65% of the energy reduction of a typical building. Elucidate four (4) energy-efficient features of this building. (12 marks)

Q3 (a) SEDA Malaysia manage Feed-in-Tariff mechanism to reduce dependency on fossil-fuel consumption for energy generation. Discuss the Feed-in-Tariff mechanism and its direct benefits to the nation.

(10 marks)

(b) SEDA later introduced Net Energy Metering. Discuss the reason for the introduction of Net Energy Metering and highlight the differences between Feed-in-Tariff and Net Energy Metering. (10 marks)

Q4 The Tenth Malaysia Plan describes the New Energy Policy 2010 as a further step to encapsulate all efforts to ensure economic efficiency, security of energy supply, and to meet the social and environmental objectives in the National Energy Policy of 1979. Justify five strategic pillars to achieve the National Energy Policy objectives.

(20 marks)

Q5 (a) Electricity Supply Act 1990 has been enacted, among others, to promote efficient use of electricity through the empowerment of ministry role.

(i) Identify sections associated with the efficient use of electricity under the act and explain briefly the ratification. (3 marks)

(ii) Ministry has been conferred power to make regulations related to efficient use of electricity under the act. Support the statement with two (2) associated regulations with their major concerns. (7 marks)

(b) Any installation which consumes or generates electrical energy equal to or exceeding 3 000 000 kWh any period of six (6) consecutive months should oblige Efficient Management of Electrical Energy Regulation 2008 (EMEER 2008).

(i) Point out the duties and responsibilities of affected installation according to EMEER 2008. (2 marks)

(ii) KMM Properties Sdn. Bhd. had consumed more than 3 000 000 kWh of total electrical energy within six (6) consecutive months from April to September 2019. In October 2019, the company had received a notice from the Energy Commission (ST) for EMEER 2008 compliance. Construct a timeline for the obligation of EMEER 2008 for at least two reporting phases to ST. (8 marks)

Q6 **(a)** MS 1525 is a code of practice that gives guidance on the effective use of energy including the application of renewable energy in new and existing non-residential buildings.

(i) Define the following jargon:

Fenestration

Overall Thermal Transfer Value (OTTV)

Roof Thermal Transfer Unit (RTTV)

(3 marks)

(ii) Point out major modifications adopted in the latest revision of MS1525:2019. (4 marks)

(b) A frontal view of the Academic Office Building is shown in **Figure Q6(b)**. The building with identical four side orientations was built with various wall materials as in **Table Q6(b)(i)**, while the solar correction factor is given in **Table Q6 (b)(ii)**. If the solar absorptivity of the wall, shading coefficient and thermal transmittance value of all glass windows are 0.5, 0.4 and 2.1 $W/m^2.K$ respectively, determine:

(i) The building's Overall Thermal Transfer Value (OTTV); (10 marks)

(ii) The total heat load of the walls. (3 marks)

– END OF QUESTIONS –

FINAL EXAMINATION

SEMESTER/SESSION : SEMESTER I 2020/2021 PROGRAMME : MDL
COURSE : ENERGY SCENARIO & POLICY COURSE CODE : MDL10203

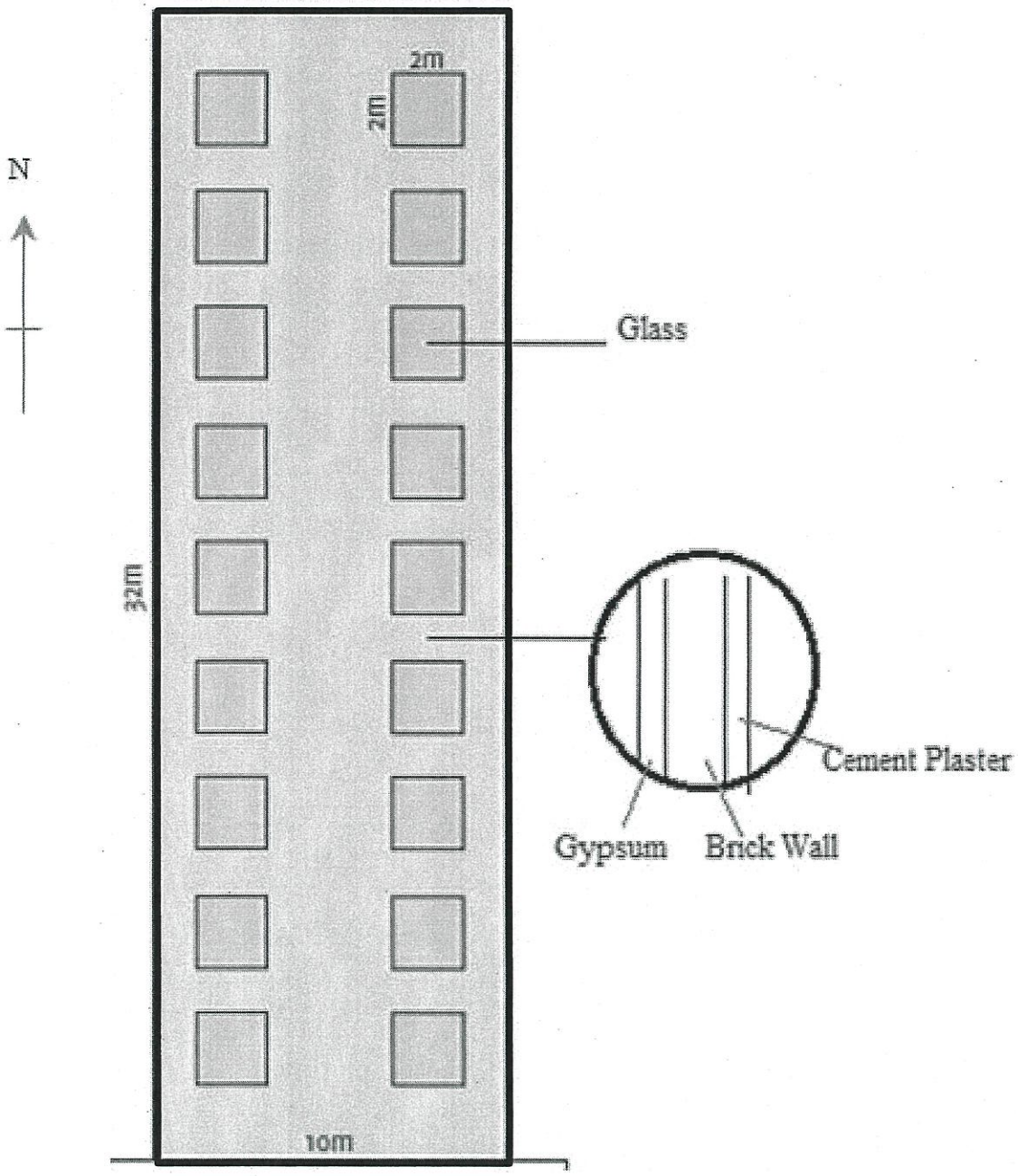

Figure Q6(b): A frontal view of the Academic Office Building

FINAL EXAMINATION

SEMESTER/SESSION : SEMESTER I 2020/2021 PROGRAMME : MDL
COURSE : ENERGY SCENARIO & POLICY COURSE CODE : MDL10203

Table Q6(b)(i): Wall materials

Material	Thermal Resistance, R (m^2.K/W)
Gypsum	0.071
Brick Wall	0.141
Cement Plaster	0.031

Table Q6(b)(ii): The solar correction factor

Orientation	N	NE	E	SE	S	SW	W	NW
CF	0.90	1.09	1.23	1.13	0.92	0.90	0.94	0.90