UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
JANUARY 2016 SEMESTER

COURSE CODE	: LED 20103
COURSE NAME	: ELECTRICAL POWER & DISTRIBUTION
PROGRAMME NAME	: DIPLOMA MARINE ELECTRICAL ENGINEERING
DATE	: 27 MAY 2016
TIME	: 08.00 AM – 11.00 AM
DURATION	: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please CAREFULLY read the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of TWO (2) sections; Section A and Section B.
4. Answer ALL questions in Section A. For Section B, answer THREE (3) questions WITH AT LEAST ONE (1) question from question 4 or question 5.
5. Please write your answers on the OMR answer script and answer booklet provided.
6. Answer all questions in English / Bahasa Melayu language ONLY.

THERE ARE 12 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 25 marks)

INSTRUCTION: Answer ALL questions.
Please use the objective answer sheet provided.

1. Electrical Power Generation consists a group of
   A. Turbine and Waterwheel
   B. Generator and Reactor
   C. Generator and Waterwheel
   D. Turbine and Generator

2. Ratio for sum maximum demand of the different consumer connected to substation of simultaneous maximum demand of all consumer. It also can be defined as a sum of individual maximum demand of consumer divided by maximum load on the system. The upper words are belong to :-
   A. Load Factor
   B. Diversity Factor
   C. Demand Factor
   D. Maximum Demand

3. Kinetic energy from water flow is used to drive
   i. Waterwheel
   ii. Generator
   iii. Turbine
   iv. Reactor
   A. i and ii
   B. i, ii and iii
   C. ii, iii and iv
   D. i and iv

4. The rotation of the turbine in hydroelectric power plants is due to the
   A. Size of turbine
   B. Water pressure
   C. High of dam
   D. Dam area

5. The value of P is given in
   A. Ohm
   B. kW
   C. km

D. kV

6. For a high flow rate (), high falling water for hydro power plant use a _____ turbine?
   A. Francis
   B. Kaplan
   C. Petron
   D. Pelton

7. How much height (H) in high falling water?
   A. > 215 M
   B. > 300 M
   C. < 215 M
   D. > 200 M

8. Hydrogen contains _____ and _____
   A. 1 proton and 2 neutron
   B. 1 nucleus and 1 electron
   C. 1 proton and no neutron
   D. 2 nucleus and 1 proton

9. Resistive heating in the core proportional to the square of voltage applied to the transformer are refer to :-
   A. Copper losses
   B. Hysteresis losses
   C. Eddy current losses
   D. Leakage flux

10. What is the advantages of HRC fuse compared to semi enclosed fuse?
   A. Capable of breaking heavy current
   B. Aging oxidization
   C. Low cost
   D. Time delay to break

11. The earthing system main earth bar will be connected to the earth chamber outside the substation. The ground resistance can be measure between the copper rod

buried and the ground. The value should be between _____ohm. The lower the better especially for electronic equipment

A. 5-10 ohm
B. 7-10 ohm
C. 20-40 ohm
D. 30-70 ohm

12. Plasma Arc can be greater than _____degrees.

A. 25,000
B. 35,000
C. 45,000
D. 55,000

13. Distribution system can be categories into 3 systems except:

A. Radial loop
B. Loop system
C. Network system
D. Substation system

14. Main components of transmission line

A. Conductor, connector and ground wire
B. Supporting building, insulator and conductor
C. Conductor, insulator and supporting structures
D. Supporting structures, insulator and connector

15. Suitable relay used to delay the tripping in MSB

A. Inverse Definite Minimum Time (IDMT OC/EF)
B. Earth Leakage Relay (ELR)
C. Gas Insulated Switch (GIS)
D. Vacuum Load Break Switch (VLBS)

16. Hold 500% of their rating for approximately one-fourth second, after which the current carrying element melts cannot be used in motor circuits, which often inrush currents greater than 500%. This statement is state for _____

A. Time-Delay Fuses
B. Non-Time Delay Fuse
C. Overload
D. Circuit breaker

17. The consumer connected to system that has connected load of 43000 KW and a maximum load of 25000 KW. Total unit consumed annually are 82 × 106 KWH. Find Demand Factor

A. 58.2% C. 25%

B. 40% D. 10%

18. The principle component of a power distribution system are

i. Provide at all time the power that consumer need.

ii. Maintain the stable nominal voltage that does not vary by more than ± 10%

iii. Maintain the stable nominal voltage that does not vary by more than ± 5%

iv. Maintain the stable frequency that does not vary by more than ± 0.1 HZ

A. i and ii

B. i, ii and iii

C. i, ii and iv

D. i, iii and iv

19. What is medium voltage for distribution system in electrical power transmission line?

A. 5 KV / 100 KV

B. 2.4 KV / 69 KV

C. 10 KV / 230 KV

D. 15 KV / 115 KV

20. Consumers are required to maintain their load power factor to a minimum of _____ for voltage level less than 132 KV and 0.90 for voltage level _____and above.

A. 0.75 and 135 KV

B. 0.85 and 125 KV

C. 0.85 and 132 KV

D. 0.95 KV and 140 KV

21. Types of fuses are

i. Silicon Fuse

ii. Semi-closed, rewirable fuse

iii. Cartridge fuse or HRC (High Rupturing Capacity) fuse

iv. Glass Fuse

A. i and ii

B. i and iv

C. i, ii and iii

D. ii, iii and iv

22. The ocean contains about 1kg of heavy water for every _____kg of sea water

A. 7000

B. 6000

C. 5000

D. 4000

23. Medium and low types of Circuit Breaker

i. ACB : Air Circuit Breaker

ii. MCB : Miniature Circuit Breaker

iii. MCCB : Moulded Case Circuit Breaker

iv. RCD : Residual Circuit Breaker

A. i, ii and iv

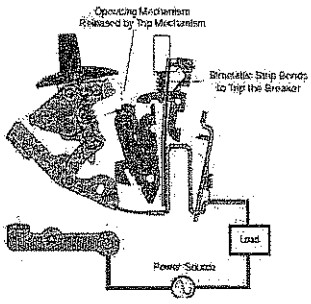
B. i, iii and iv

C. ii, iii and iv

D. All the above

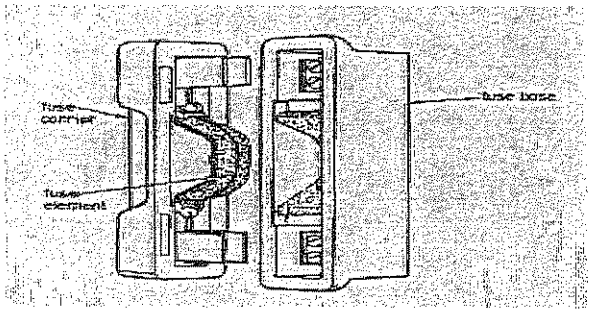
24. Choose Circuit Breaker design

i.

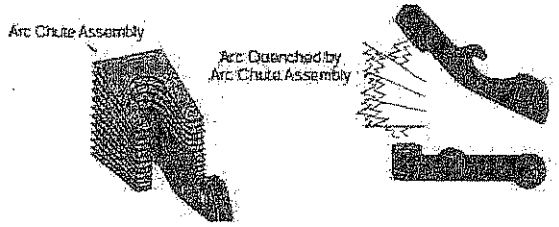


ii.

iii.



iv.



A. i, ii and iii

B. i, iii and iv

C. i, ii and iv

D. All the above

25. For RCCB/ ELCB/ MCB/ MCCB/ and ACB, which current is more sensitive?

A. 30mA

B. 60mA

C. 90mA

D. 120mA

SECTION B (Total: 75 marks)

INSTRUCTION: Answer THREE (3) questions ONLY.
Please use the answer booklet provided.

Question 1

(a) The consumer connected to system that has connected load of 75000kW and a maximum load of 30000kW. Total unit consumed annually are 84 x 10^6 kWh. Find:

i. Demand factor

(3 marks)

ii. Load factor

(3 marks)

(b) A residential consumer has connection of 25 lamps each of 60 watt. Load demand is shown in Table 1 :-

Table 1: Load Demand

Time	No. of lamp
6 pm – 7 pm	4
7 pm – 8 pm	20
8 pm – 10 pm	6
10 pm – 12 pm	2
12 pm – 6 am	1
6 am – 6 pm	0

i. Calculate the daily load factor and monthly bill if the electric supplier charges RM0.30 per unit?

(10 marks)

ii. Calculate the daily load factor for the first four hours?

(3 marks)

(c) A building has the following connected load

Lamp of 60 Watt each	350 nos
Lamp of 40 Watt each	120 nos
Power point of 30 watt each	100 nos
Lift 15kW	1 unit

i. By assuming those 225 lamps of 60 Watt, 95 lamps of 40 Watt and 30 Watt x 65 power point work simultaneously. Find the demand factor light and load?

(3 marks)

ii. If the demand factor of the lift is 92%. Calculate maximum overall demand factor for entire building?

(3 marks)

Question 2

(a) Give a definition and function of fuse:-

(4 marks)

(b) States the type of fuses are generally used.

(3 marks)

(c) Give a definition and function of circuit breaker

(4 marks)

(d) Lists 2 types of High Circuit Breaker and 2 types of Medium and Low Circuit Breaker

(4 marks)

(e) There are 2 types of tripping in a circuit breaker

(2 marks)

(f) Please lists the three main function of RCD (Residual Current Device)

(3 marks)

(g) In protection devices, define:

i. ACB
ii. MCB
iii. MCCB
iv. RCD
v. ELCB

(5 marks)

Question 3

(a) Distribution system can be categories into 3 systems. List down, give one (1) advantage and one (1) disadvantage of each system.

(9 Marks)

(b) List down the Principle component of a power distribution system

(5 marks)

(c) List down 5 major component of substation :-

(5 marks)

(d) Defined the Switches and Breakers below :-

i. GIS

(1 marks)

ii. VLBS

(1 marks)

iii. ALBS

(1 marks)

iv. RCCB

(1 marks)

v. OCB

(1 marks)

vi. MCB

(1 marks)

Question 4

The Per unit system are another approach to solve circuits containing of transformers. A simple power system are given by the circuit shown in Figure 1. If the generator is rated at 480 V and 10 kVA, evaluate the base voltage, current, impedance and apparent power at every points in the power system.

(25 marks)

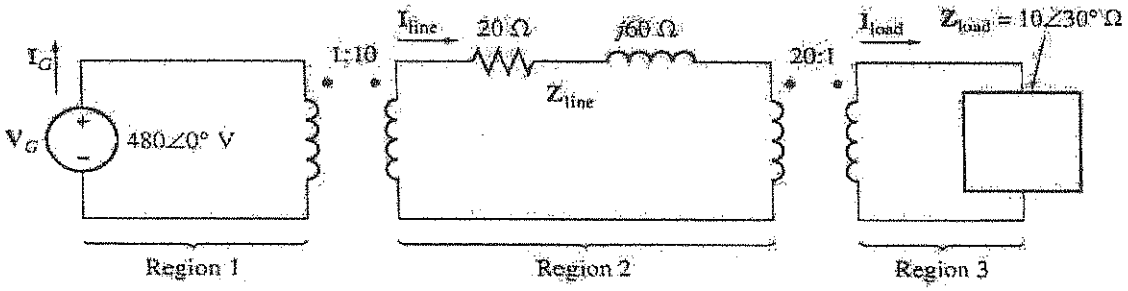


Figure 1

END OF EXAMINATION PAPER