

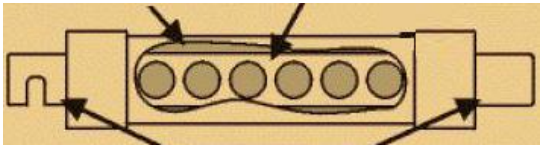
Module 5: Protection in Electrical System

Name:

Date:

Part A: Multiple choice question (MCQ)

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| <p>1) The following fault can happen, except.</p> <p>(a) break or open line<br/>(b) isolator can be switched on<br/>(c) poor termination<br/>(d) blown fuse</p> <p>2) This device can detect leakage current between source and body of equipment.</p> <p>(a) fuse<br/>(b) miniature circuit breaker<br/>(c) residual current device<br/>(d) mold case circuit breaker</p> <p>3) "Current exceeding the rated value of a circuit" is refer to.</p> <p>(a) over-current<br/>(b) earth fault<br/>(c) continuity good<br/>(d) resistance is too high</p> <p>4) The following are the compliance with IEE Wiring Regulations about the designed installations is true, except.</p> <p>(a) prevent injury<br/>(b) prevent damage to equipment<br/>(c) minimized interruption of power<br/>(d) improve power factor</p> <p>5) Open circuit or open line means...</p> <p>(a) the circuit is broken line<br/>(b) switch on position<br/>(c) circuit at fault<br/>(d) circuit is energized</p> | <p>6) What is the sensitivity value of RCCB for three phase supply?</p> <p>(a) 10 mili-amp<br/>(b) 30 mili-amp<br/>(c) 100 mili-amp<br/>(d) 300 mili-amp</p> <p>7) What is the cause of a miniature circuit breaker to cut off the supply or trip a circuit?</p> <p>(a) because of over-current fault<br/>(b) because of earth leakage<br/>(c) because of neutral over-current<br/>(d) because of poor insulation</p> <p>8) What is the rating of lighting circuit used on a miniature circuit breaker?</p> <p>(a) 10 ampere<br/>(b) 32 ampere<br/>(c) 6 ampere<br/>(d) 20 ampere</p> <p>9) This type of fuse is able to withstand high current short circuit condition.</p> <p>(a) ceramic fuse<br/>(b) rewirable fuse<br/>(c) high rupturing capacity<br/>(d) high breaking capacity</p> <p>10) "Part of fuse which comprises a fuse element and a cartridge", this statement is.</p> <p>(a) fuse element<br/>(b) fuse link<br/>(c) fusing factor<br/>(d) breaking capacity</p> |
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- 11) Earth fault relay is device which operates on principles of.
- current transformer
  - induction
  - resistive device
  - power factor
- 12) An earth fault happen due to the following reason, except.
- equipment shorted internally
  - MCB will trip
  - terminal not tighten properly
  - damage cable or wounded conductor
- 13) What is tripping time allowed for RCD to operate in event of a fault?
- 1 second
  - $\frac{1}{2}$  second
  - < 40 mili-second
  - > 50 mili-second
- 14) What is the sensitivity value of RCD for single phase supply?
- 10 mili-amp
  - 30 mili-amp
  - 100 mili-amp
  - 300 mili-amp
- 15) Which is the correct formula to calculate the operating current to blow a fuse circuit or causing MCB to trip?
- $I_2 = 0.725 \times I_z$
  - $I_2 = 1.45 \times I_z$
  - $I_2 = 240v / I_z$
  - $I_2 = 1.45 / I_z$
- 16) What is fusing factor?
- the ratio of current rating
  - the ratio of fusing current to current rating
  - the maximum operating current
  - the breaking capacity in event of fault
- 17)
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- Refer to figure above is a HBC fuse, the X is a \_\_\_\_\_.
- fuse element
  - fuse filler
  - metal piece
  - silica
- 18) HRC fuse are used to protect the following, except.
- transformer
  - electric motor
  - overhead line
  - 100 watt discharge lamp
- 19) What is the sensitive of an earth fault relay?
- 10 mili-amp
  - 30 mili-amp
  - 100 mili-amp
  - 500 mili-amp
- 20) This earth fault relay need this to reduce the current for measurement purposes.
- voltage transformer
  - power transformer
  - current transformer
  - audio transformer

Part B: Subjective Question

1) a) What is the three (3) common fault in electrical system?

i) .....

ii) .....

iii) .....

b) List down three (3) types of earth protectors device.

i) .....

ii) .....

iii) .....

2) a) List three (3) advantages of miniature circuit breaker.

i) .....

ii) .....

iii) .....

b) List two(2) disadvantage of rewirable fuse.

i) .....

ii) .....

c) List down three (3) advantages of HRC fuse?

i) .....

ii) .....

iii) .....

d) Mold case circuit breaker (MCCB) has four (4) types of breaking capacity, list them down.

i) .....

ii) .....

iii) .....

iv) .....

- 3) a) A circuit using copper conductor sized  $4.0\text{mm}^2$  with the k value 115. The fault current calculated is 375 ampere. Calculate the disconnection time of the fuse installed to protect this circuit.

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- b) A load of 3500w/240 volt is connect to a protection rating of 20A MCB, given the value of  $C_a$  is 0.7 and  $C_g$  is 0.65, calculate the current carrying capacity ( $I_z$ ).

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- 4) Explain how the magnetic type circuit breaker operates.

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Answer Scheme for MCQ

1)	<b>B</b>	11)	<b>A</b>
2)	<b>C</b>	12)	<b>B</b>
3)	<b>A</b>	13)	<b>C</b>
4)	<b>D</b>	14)	<b>C</b>
5)	<b>A</b>	15)	<b>B</b>
6)	<b>D</b>	16)	<b>B</b>
7)	<b>A</b>	17)	<b>A</b>
8)	<b>C</b>	18)	<b>D</b>
9)	<b>C</b>	19)	<b>D</b>
10)	<b>B</b>	20)	<b>C</b>