Candidate's Number .....

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION

NATIONAL FORM II EXAMINATION - NOVEMBER, 1986

0084 ELECTRICAL ENGINEERING

TIME: 2 Hours.

This paper consists of sections A and B. Section A comprises questions from CIVIL, ELECTRICAL and MECHANICAL Engineering.

Attempt ALL questions from both sections.

You are advised not to spend more than 2 minutes per question in section A and not more than 4 minutes in section B.

This paper consists of 8 printed pages.

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Questions 1 - 14 are of multiple choice. Choose the correct answer and insert the corresponding letter in the space provided.

1. The ratio used in mortar of 1:1:3 is for:
   A. Lime-sand mortar
   B. Cement-soil mortar
   C. Cement-lime-sand mortar
   D. Lime-sand-soil mortar. [ ]

2. The following tool is not one of the marking and measuring tool,
   A. Spirit level
   B. Flat scraper
   C. Solid square
   D. Bever and bevel protractor. [ ]

3. A magnet has the properties of:
   A. Pointing North and South when freely suspended.
   B. Pointing West and East when freely suspended.
   C. Withstanding the corrosive effects
   D. Attracting papers and woods. [ ]

4. An A.C. welding transformer can work only,
   A. By using d.c. motor and generator
   B. When there is a supply of electricity from the mains.
   C. By using a burning forge
   D. When there is a supply of hydrogen. [ ]

5. Many domestic electric appliances, such as laundry iron, the kettle, electric cookers, contain heating-elements are made from:
   A. Pure metals
   B. Copper or aluminium materials
   C. Nichrome or one of the other Nickel alloys
   D. Carbon. [ ]

6. Electricity inside a battery is a follow of:
   A. Neutrons
   B. Protons
   C. Electrons
   D. Ions. [ ]

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7. The worker who operates one machine is a:
   A. Mechanic
   B. Machinist
   C. Man with broadworkshop experience
   D. Specialist.

8. When you lean against the machine while it is running what will happen ?
   A. The machine will slow down
   B. The rate of feed will vary
   C. The teacher will think that you are asleep
   D. An accident may occur.

9. The machinist uses a hammer as chisel in:
   A. Tightening nuts
   B. Loosening nuts
   C. Removing metal
   D. Identing graduations.

10. Welding goggles protect the:
   A. Welder's face
   B. Welder's wrist
   C. Welder's head
   D. Welder's eyes.

11. A tool used for cutting when making joints on timber is a
   A. Hammer
   B. Hacksaw
   C. Tenon saw
   D. Knife.

12. A marking knife is used for:
   A. Marking lines along the grains of wood
   B. Marking lines which have to be cut on wood usually across the grains.
   C. Marking circles and parts of a circle.
   D. Marking circles only.

13. The tool which is not used in checking the verticality (plumbness) of a wall is:
   A. A line together with a pin
   B. Sprit level
   C. Plumb-bob
   D. Chain.

14. A tool used for cleaning rough timber is a:
   A. Bench hook
   B. Jack plane
   C. File
   D. Smoothing plane.

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Questions 15 - 20 require short answers. Write the answers in the space provided.

15. Name any five tools which are commonly used in brick-work:
   (i) _____
   (ii) _____
   (iii) _____
   (iv) _____
   (v) _____

16. Name any three sources of electricity:
   (i) _____
   (ii) _____
   (iii) _____

17. To protect a finished surface from vicejaw marks, use a piece of:
   _____
   _____

18. List four types of lampholders mainly used in Tanzania:
   (i) _____
   (ii) _____
   (iii) _____
   (iv) _____

19. Name the hand tools used in the following operations:
   (i) Tenoning _____
   (ii) Testing straightness of timber _____
   _____
   (iii) Gauging for mortises _____
   _____

20. _____ is used to coat dark surfaces for laying outlines.

For questions 21 and 22, match the following terms from list B, by completing the table provided.

21. List A
   (a) A plane is used
   (b) A hand drill is used
   (c) A sliding bevel is used
   (d) A marking gauge is used.

   List B
   A. for smoothing timber
   B. to mark a line for rebate
   C. for boring holes in the timber
   D. to test the slope of wood work piece
   E. for cutting tenon.

LIST A	LIST B
(a)	
(b)	
(c)	
(d)	

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22. List A

(a) Side cutter plier

(b) Electric drill

(c) Do not operate any machine without the authority of workshop incharge.

(d) Fuse.

LIST A	LIST B
(a)	
(b)	
(c)	
(d)	

List B

A. Tool used by fitters

B. Protective device

C. CIRCUIT BREAKER

D. Workshop rule

E. Power tool

F. Hand tool.

For questions 23 to 26, write true or false in the space provided.

23. If the primary winding of transformer has 500 turns and the secondary winding has 1000 turns, then 100 V applied across the primary will produce 200 V across the secondary. _____

24. A moving-coil meter makes use of the magnetic field produced by a flow of electrons. _____

25. P.V.C. cable is used for underground installation. _____

26. The unit of measurement of power is a joule. _____

For questions 27 to 29, match the following terms from list A with correct meaning from list B by completing the table provided.

27. List A

A. Open circuit

B. Transformer

C. Final sub circuit

D. Rewirable fuses, H.B.C. fuses and catridge fuses.

LIST A	LIST B
A	
B	
C	
D	

List B

(a) Will carry current

(b) Profective device

(c) Instruments

(d) A device for stepping up/down voltage or current.

(e) a circuit connected to distribution board.

(f) Cannot carry current

(g) Parallel circuits.

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28. List A

A. Fusing current
B. Fuse rating
C. Three heat switch
D. Portable Electric drill.

List B

(a) A current which operates a fuse in time.
(b) A switch with low and high, medium
(c) a current which fuses can carry without over heating.
(d) a device fixed at one place
(e) a device which can be moved here and there.

LIST A	LIST B
A	
B	
C	
D	

29. List A

A. Electromagnetic field
B. Insulation, conductor and mechanical protection.
C. 2.5 times the out side diameter
D. Galvanized-conduit
E. Enamelled-conduit.

List B

(a) Is for external use of an installation.
(b) Is for external use in dry situation installation.
(c) main parts of a cable
(d) metal clips
(e) Types of cables
(f) permissible inner radius of a conduit bend.
(g) field having direction and force which surrounds a charged coil.

LIST A	LIST B
A	
B	
C	
D	
E	

30. The effects of an electric current are:

(i) _____
(ii) _____
(iii) _____

31. A meter movement requires a current of 50 micro Amps. to give full scale deflection and has a resistance of 500 ohms. The value of the multiplier required to cause full scale deflection of 1 volt is

_____
_____
_____

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32. For a temperature increase the resistance of pure metals, such as copper will be _____

33. Three capacitors of 3 micro Faradays, 2 micro Faradays and 6 micro Faradays are connected in series. The equivalent capacitance is _____

34. Give three types of faults which are likely to occur always in electric circuits:
(i) _____
(ii) _____
(iii) _____

35. The current rating of fuse protecting a ring circuit is _____ and the conductor size is _____ respectively.

36. The difference between a flexible cable and flexible cord is _____

37. The materials used for each component part of a M.I.C.S. cable are
(i) _____
(ii) _____
(iii) _____

38. The colour code of cables used for wiring a three pin plug are
(i) _____ or _____
(ii) _____ or _____
(iii) _____ or _____

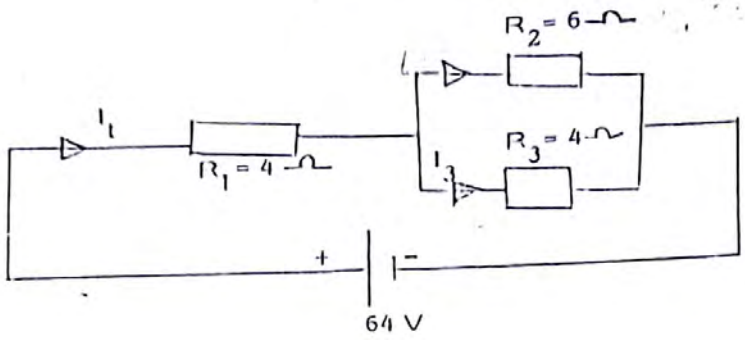
39. The use of miniature circuit breaker and earth leakage circuit breakers in an electric circuit area _____ and _____ respectively.

40. How many units of electricity are used if a refrigerator rated at 250W is run for 12 hours. _____

41. Name three electrical measuring instruments used on live circuits
(i) _____
(ii) _____
(iii) _____

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42.



In the figure above find the current in the 4 ohms resistor (ie R_3).

_____

_____

_____

_____

43. How do the poles of two magnets with their N-pole and S-pole facing each other behave when placed close to one another?

_____

_____

_____

44. Name three types of single pole switches used for lighting in domestic installation.

(i) _____

(ii) _____

(iii) _____

45. What is a conductor? _____

_____

_____

46. A wattmeter is a combination of two instruments:

(i) _____

(ii) _____

_____

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