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ELECTRICAL INSTALLATION

PAPER 1 4130/1

Thursday **10 MAY 2018** 10:30 A.M.–11:30 A.M.

Additional materials:
Coloured pencils

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials in the spaces provided on this booklet.

Attempt **ALL** the questions. Write your answers in the spaces provided below each question.

INFORMATION FOR CANDIDATES

The number of marks available is shown in brackets [] at the end of each question or part question.

Electronic calculators are allowed.



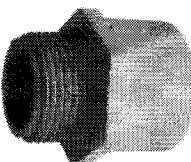
This question paper consists of 8 printed pages.

Answer **ALL** questions. Write your answers in the spaces provided.

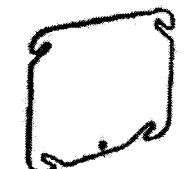
1. (a) Identify the following standard components that may be fitted to an outlet box.

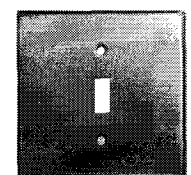
(i)  _____ [1]

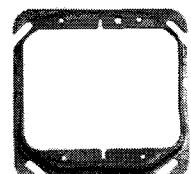
(ii)  _____ [1]

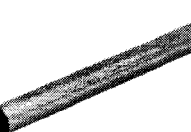
(iii)  _____ [1]

(iv)  _____ [1]

(v)  _____ [1]

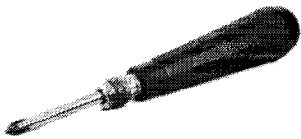
(vi)  _____ [1]

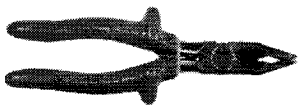
(vii)  _____ [1]

(viii)  _____ [1]

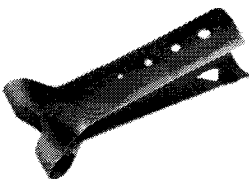


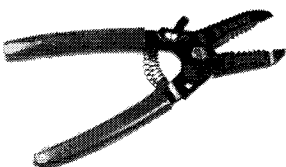
1. (b) Identify the following tools.

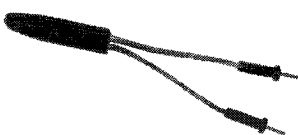
(i)  _____ [1]

(ii)  _____ [1]

(iii)  _____ [1]

(iv)  _____ [1]

(v)  _____ [1]

(vi)  _____ [1]

2. Circle the letter beside the correct answer. Conventional electric current flow is from

(a) negative to positive

(b) positive to negative [2]

3. List **FOUR** units of electricity.

- (i) _____ [1]
- (ii) _____ [1]
- (iii) _____ [1]
- (iv) _____ [1]

4. List **FOUR** basic parts of an electrical circuit.

- (i) _____ [1]
- (ii) _____ [1]
- (iii) _____ [1]
- (iv) _____ [1]

5. The colour code for 125V receptacle is:

- (i) _____ [1]
- (ii) _____ [1]
- (iii) _____ [1]

6. Write down the symbols for the following.

- (i) Current _____ [1]
- (ii) Amperes _____ [1]
- (iii) Resistance _____ [1]
- (iv) Ohm _____ [1]
- (v) Voltage _____ [1]
- (vi) Power _____ [1]



7. A circuit connected in _____ provides two or more independent current paths. [1]

8. The process of bonding all non-current carrying metal parts in an installation and connecting to earth ensures that the system is _____. [1]

9. An electric tea kettle uses 8 Amperes of current and has a resistance of 15 Ohms.

(a) What is the voltage drop across the tea kettle?

 [3]

(b) What is the power dissipated by the tea kettle?

 [3]

10. List **THREE** advantages of using fluorescent lighting.

(i) _____ [1]

(ii) _____ [1]

(iii) _____ [1]

11. (a) How much current does a 75-watt lamp rated at 120V use?

 [3]

- (b) What is the resistance of the lamp?

 [3]

12. State the colour and name of the conductors found on a 4-way switch.

(i) Colour _____ [1]

(ii) Name _____ [1]

13. State what the following protects against.

(i) Fuse _____ [1]

(ii) Breaker _____ [1]

(iii) GFCI _____ [1]

(iv) AFCI _____ [1]

14. State **TWO** metals that can be magnetised.

(i) _____ [1]

(ii) _____ [1]

15. What switches are used to control a load from 4 locations?

(i) _____ [1]

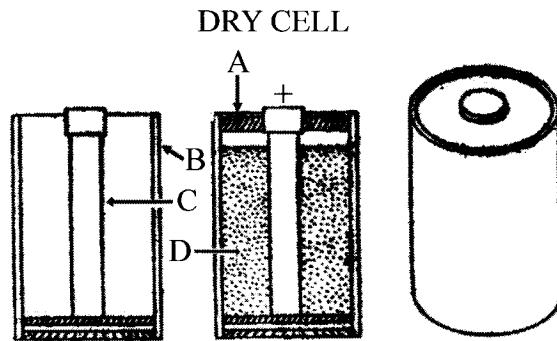
(ii) _____ [1]



16. What voltage is used in homes for

- (i) Lighting? _____ [1]
- (ii) Electric Range? _____ [1]

17. Label the parts of the dry cell below

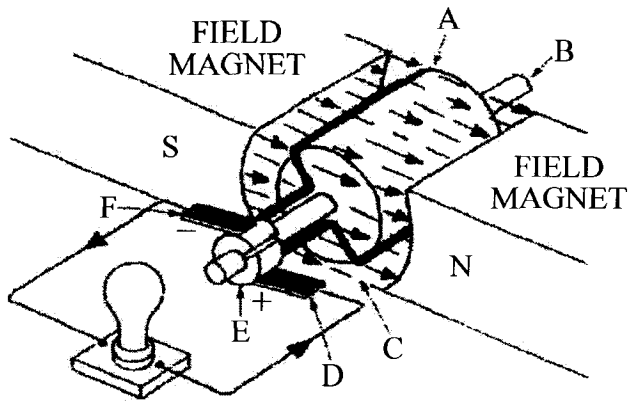


- (i) A _____ [1]
- (ii) B _____ [1]
- (iii) C _____ [1]
- (iv) D _____ [1]

18. Indicate the ampacity of the following THWN copper conductors.

- (i) 14 AWG _____ amperes [1]
- (ii) 8 AWG _____ amperes [1]
- (iii) 6 AWG _____ amperes [1]
- (iv) 3 AWG _____ amperes [1]
- (v) 0 AWG _____ amperes [1]
- (vi) 000 AWG _____ amperes [1]

19. (i) Label the parts of the DC generator shown below.



- A. _____
 B. _____
 C. _____
 D. _____
 E. _____
 F. _____ [6]

- (ii) A _____ converts mechanical energy to electrical energy and a _____ converts electrical to mechanical energy. [2]
- (iii) How many watts are equal to one horse power? _____ [1]



School Number	Candidate Number
Surname and Initials	

ELECTRICAL INSTALLATION

PAPER 2 4130/2

Monday **14 May 2018** 9:00 A.M.–10:30 A.M.

Additional materials:
Coloured pencils

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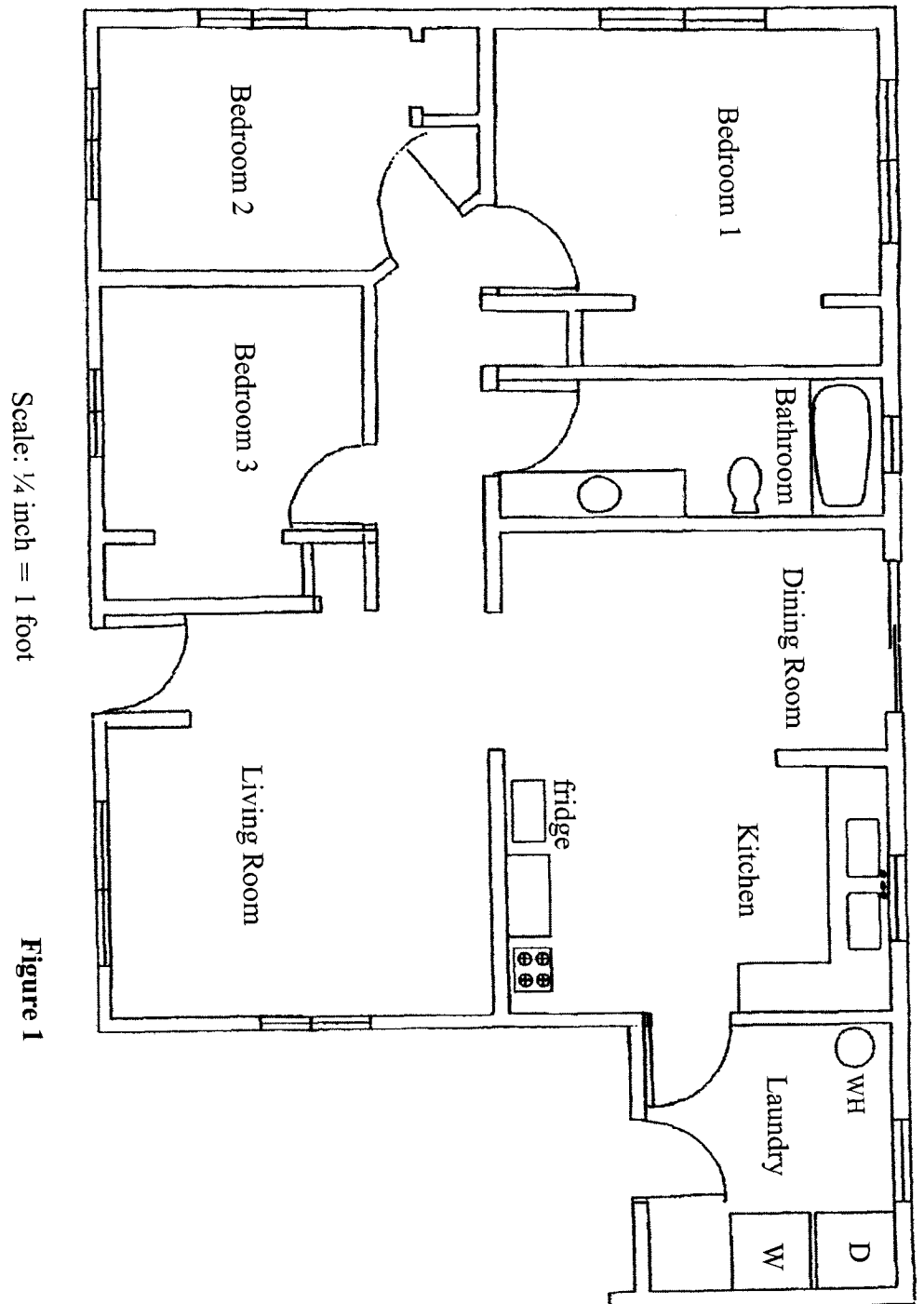
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This question paper consists of 7 printed pages and 1 blank page.

1. The drawing **Figure 1** shows the plan of a single residential dwelling consisting of the usual rooms and facilities.

(a) Show on the drawing (**Figure 1**) the position of each outlet and control device. [16]



(b) Determine the following which relates to your planned installation:

(i) the total floor area (use the given scale on the plan);

[4]

(ii) the floor power (wattage).

[2]

2. A step-down transformer has a turns ratio of 15:1 and 250 volts on the secondary. When a load is placed across the secondary terminals the current drawn is 4 amperes.

Calculate:

- (a) the power consumed by the load when it is switched on.

[3]

- (b) the resistance of the load.

[3]

- (c) the primary current.

[4]

- (d) the input voltage.

[4]



- (e) Sketch the transformer circuit, showing input and output voltages, current and load. [6]

3. (a) Identify the parts of the circuit shown below in **Figure 2**.

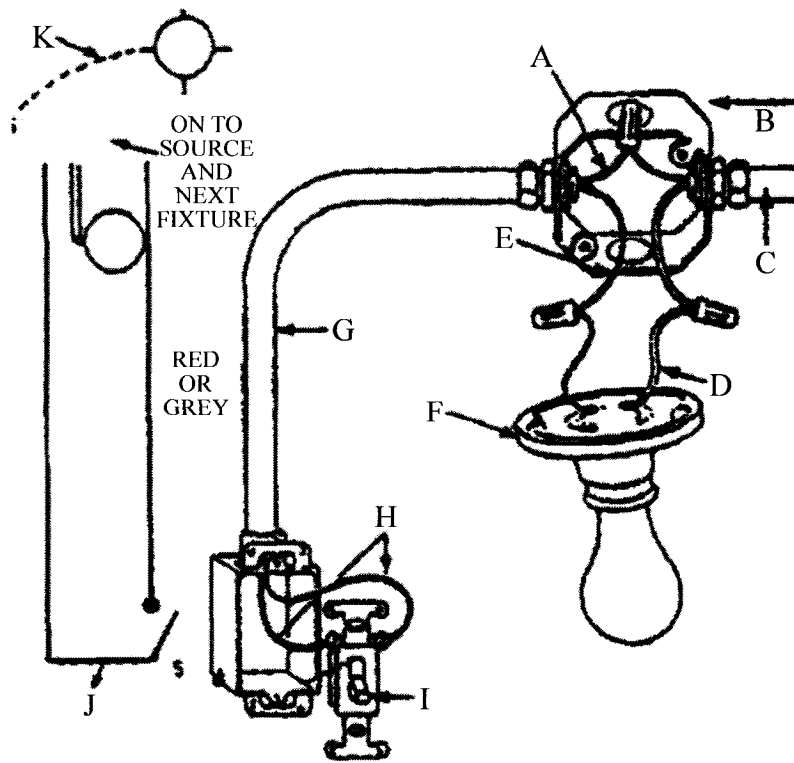
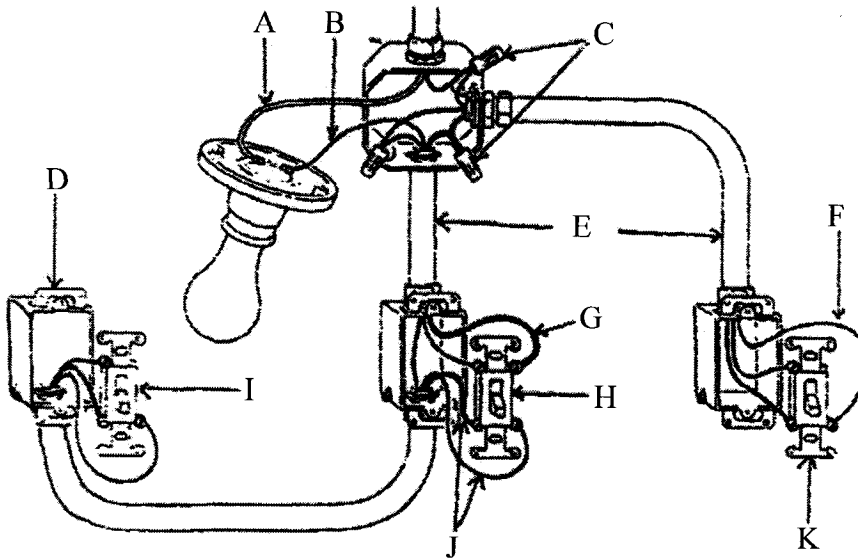


Figure 2

- A. _____
 B. _____
 C. _____
 D. _____
 E. _____
 F. _____
 G. _____
 H. _____
 I. _____
 J. _____
 K. _____

[5½]

(b) Label the parts on the pictorial shown below in **Figure 3**.

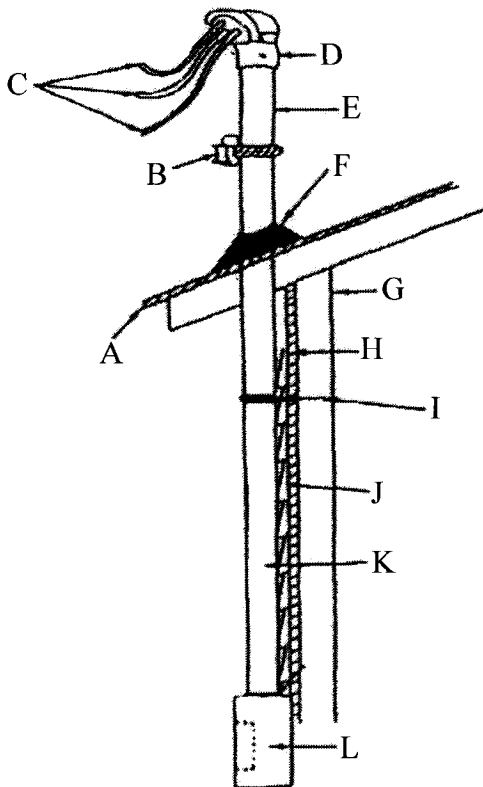


- A. _____
- B. _____
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____
- H. _____
- I. _____
- J. _____
- K. _____

[5½]

Figure 3

(c) Identify the parts on the service entrance diagram in **Figure 4**.



- A. _____
- B. _____
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____
- H. _____
- I. _____
- J. _____
- K. _____
- L. _____

[6]

Figure 4

4. Use coloured pencils and draw the correct colour wires to complete **Figure 5** and **Figure 6**.

- (a) **Figure 5** shows a light controlled by a switch and a live receptacle. The source is at the light. The conduit run is E.M.T. [5]

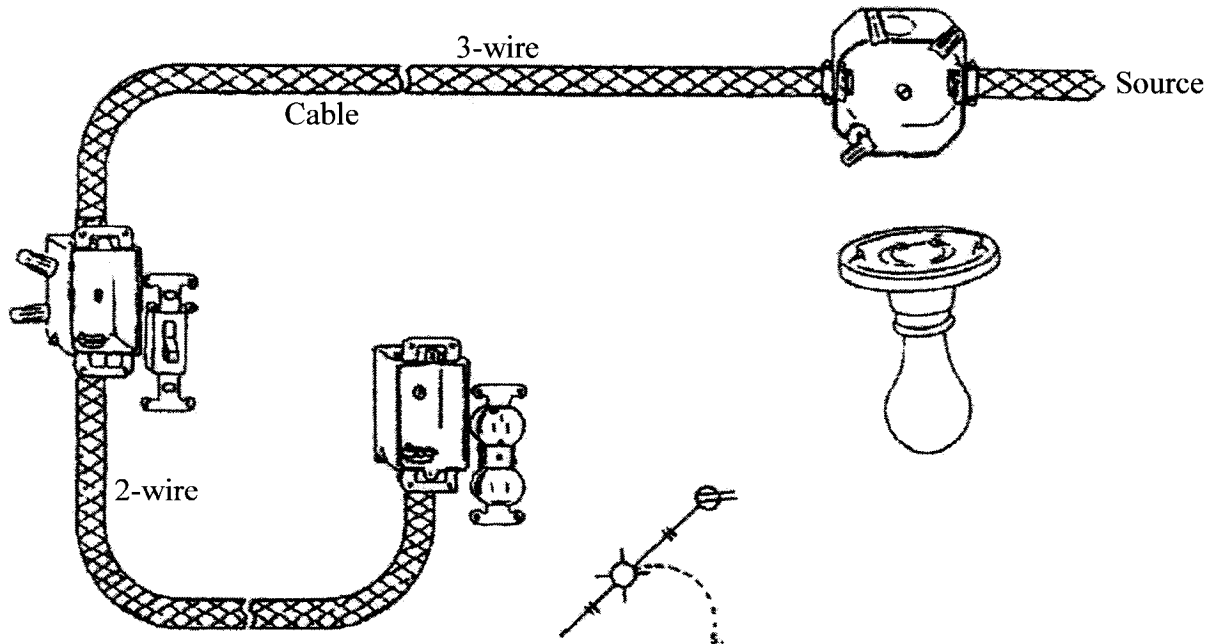


Figure 5

- (b) **Figure 6** shows a light controlled by a switch and two live duplex receptacles. The source is at the light. The conduit run is F.M.T. [6]

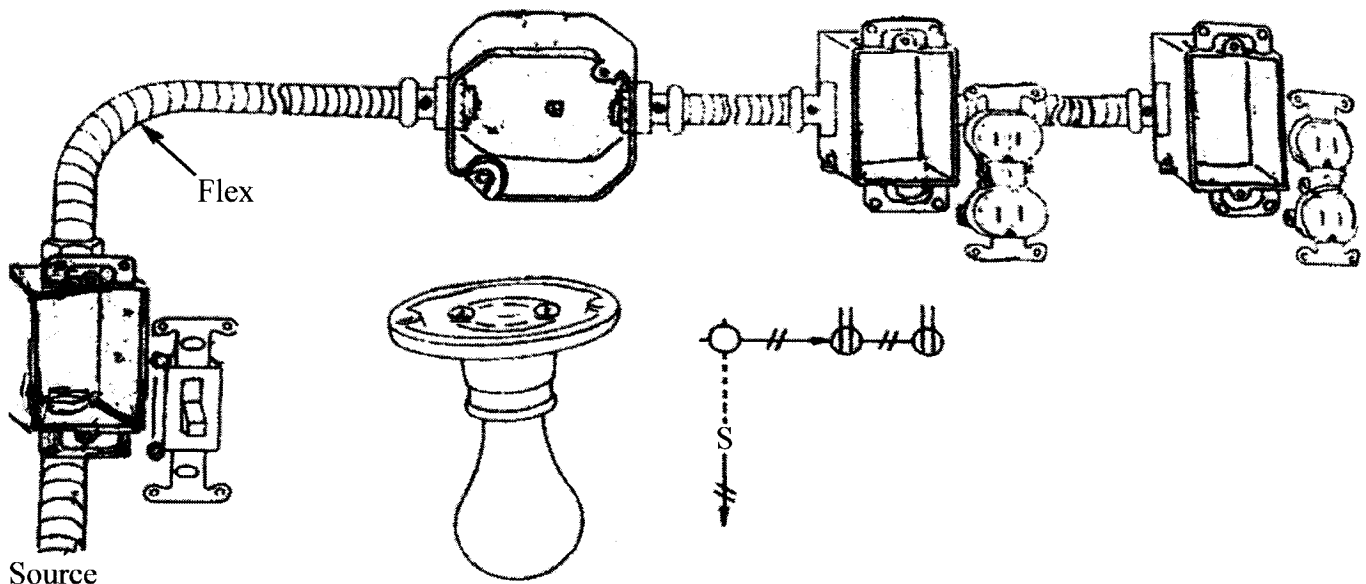


Figure 6

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