KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ENGINEERING

B.Sc. (Engineering) Supplementary Examination, 2015, First Year

ME 195/CE 153: ENGINEERING TECHNOLOGY **TIME ALLOWED: 2 hrs 30mins**

ANSWER ALL QUESTIONS. In PARTS I, II & III SEPARATELY.

NO BOOKS ARE ALLOWED ***INDEX NUMBER:*** **……**

PART I (MECHANICAL) ***PROGRAMME*/DEPARTMENT: ……..**

Q1a). Below is the SAFETY BOOT you were supplied at the beginning of this semester. State the reason why the College supplied this boot to you and all engineering students. _____
_____

The manufacturer stated six (6) features of the SAFETY BOOT as: *Toe cap; steel midsole; shock absorbent; oil resistant; petrol and chemical resistant and anti-slip* both in icons and words

b) State precisely the two (2) main features written under the safety boot _____ and _____

c) Label the safety boot below the following parts: *steel toe cap, padded tongue, padded collar, anti slip oil resistant sole, shock absorption on heels, reinforce counter and reinforced eyelets*

30 marks

Q2. State the functions of the following components associated with CENTRE LATHE machine used in the machine shop: (20 marks)

Tailstock:_____

Headstock: _____

Compound Slide: _____

Tool Holder: _____

Cross Slide: _____

Feed Shaft: _____

Lead Screw: _____

Jaws: _____

Dead Centre: _____

Carriage/Saddle/Apron: _____

Q3. A stroke is the movement of the piston from Top Dead Center (TDC) to Bottom Dead Center (BDC). What is meant by dead centers? _____
_____
_____ ***(5 marks)***

Q4 Apart from the breaking system, what other means can be used to reduce speed of a vehicle in automobile._____
_____ ***(5 marks)***

Q5. State one function for each of the following major parts in the automobile (20 marks)

a. Crankshaft _____

b. Carburetor _____

c. Piston rings _____

d. Flywheel _____

e. Alternator _____

f. Battery _____

g. Gearbox _____

h. Cam Shaft _____

Q6. Insert the name of the appropriate machine tool you saw in the machine shop of Mechanical Engineering workshop in the following sentences: ***(15 marks)***

A …… Machine is generally/commonly used to manufacture gear teeth

A ……..……Machine is generally/commonly used to manufacture external keyways

A ……..… Machine is generally/commonly used to manufacture internal keyways

A …… Machine is generally/commonly used to make multiple holes in a flat plate

A …… Machine is generally/commonly used to make smooth flat surfaces

A …… Machine is generally/commonly used to manufacture thread on a short shaft

Q7. . Name any three other alternate sources of non -conventional energy ***(6 marks)***

i.……

ii.……

iii.……

Q8. Suggest **four** uses of compressed air ***(4 marks)***

i. ……

ii. ……

iii. ……

iv……

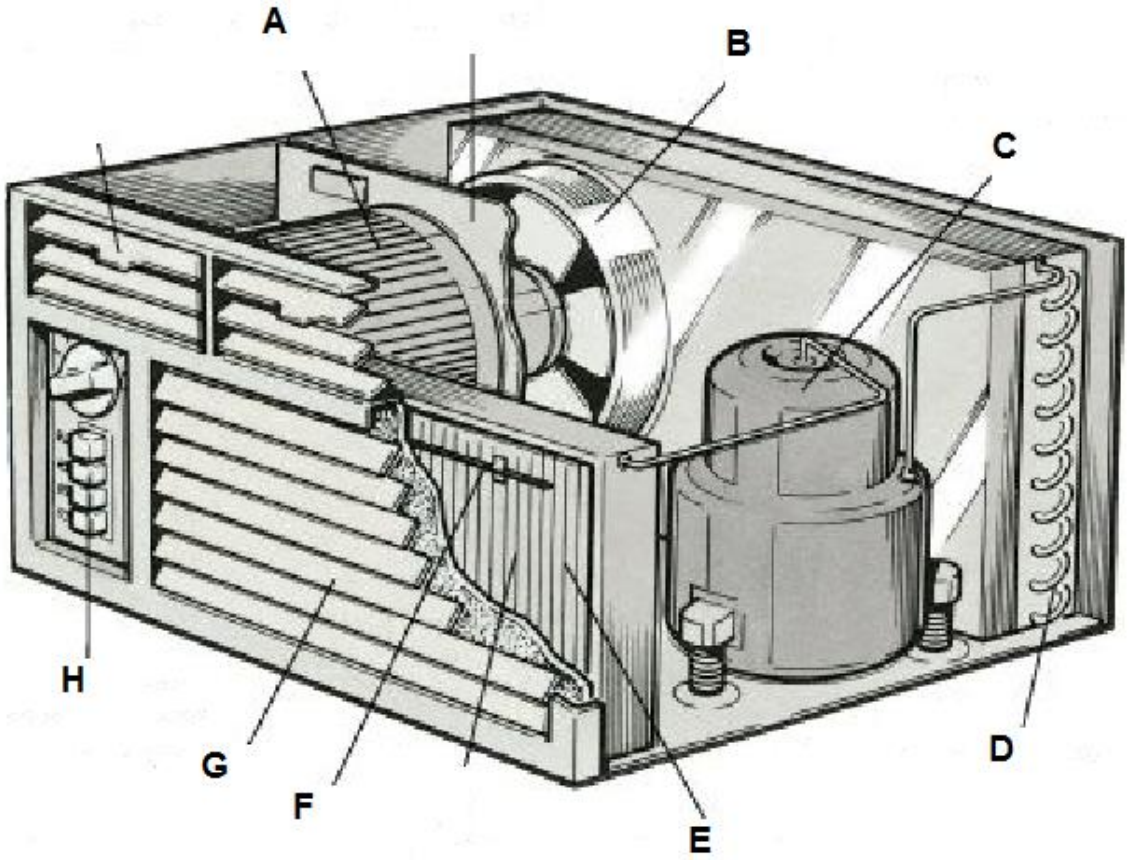
Q9. List any three types of fire extinguishers ***(4 marks)***

i. .....

ii. .....

iii. .....

Q10 LABEL THE DIAGRAM SHOWN BELOW *(15 marks)*



A…… B…….

C……. D……..

E……. …… F ……..

G……. H ……...

Q11. State the reading on the micrometer shown in figure 1 ***(3 marks)***

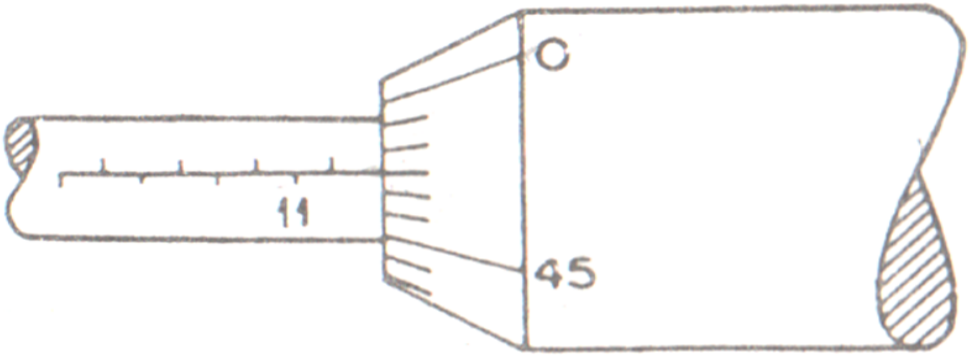


Figure 1

ANS: .....

Q12 Sketch, label and state the composition of the three (3) common flames associated with oxy-acetylene welding. ***(14 marks)***

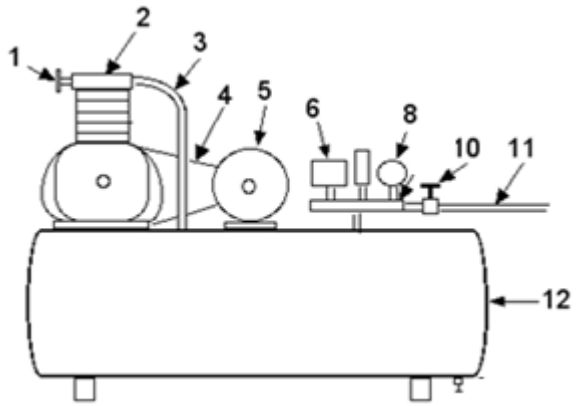
i.

ii.

iii.

Q13a). What equipment is shown below? ..... ***(2 marks)***

b. LABEL THE DIAGRAM SHOWN BELOW ***(10 marks)***



1	
2	
3	
4	
5	
6	
8	
10	
12	

Q14 State the institution of State responsible for the compliance of the Industrial Safety**:** ***(5 marks)***

.....

Q15 List **<u>four</u>** industries where Steam Boiler could be employed and state its use or application ***(4 marks)***

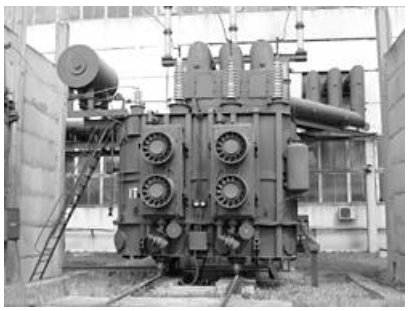
i. ……

ii. ……

iii. ……

iv. ……

Q16. . Electricity generated at power plants get to the consumer through cables and other devices. State the names of the electrical devices and equipment listed below. ***(15 marks)***



A …… **B. ……** **C ……**

Q17 State the name of the machine tool in figure 2 (*2 marks)*

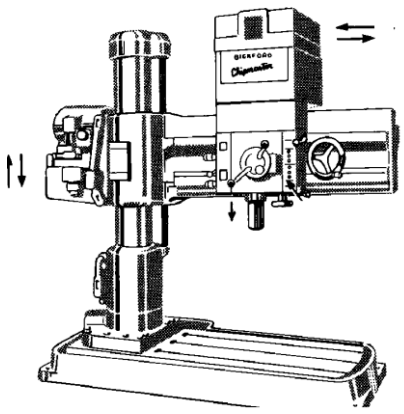


Figure 2: _____

Q18. In your room you have the following appliances and operate them on daily basis. Determine your daily energy consumption in Watt-hours (Wh), kilowatt-hours (kWh) and units of electricity (Units). ***(5 marks)***

No.	Appliance	Power (Watts)	Time (hours)	Energy (Watthours)
1	refrigerator	100	12	
2	water heater	1000	½	
3	Electric Iron	1200	½	
4	Rice cooker	900	½	
5	Television	80	6	
6	Standing Fan	70	6	
7	Laptop Computer	90	6	
8	Compact Fluorescent Lamp (CFL)	20	8	
9	LED bulb	9	10	
			Total	

i. …… Wh ii. …… kWh . iii. …… Units

Q19 Complete the wiring diagram of a Solar Home System (SHS) figure 3 below by joining the correct connecting terminals. ***(10 marks)***

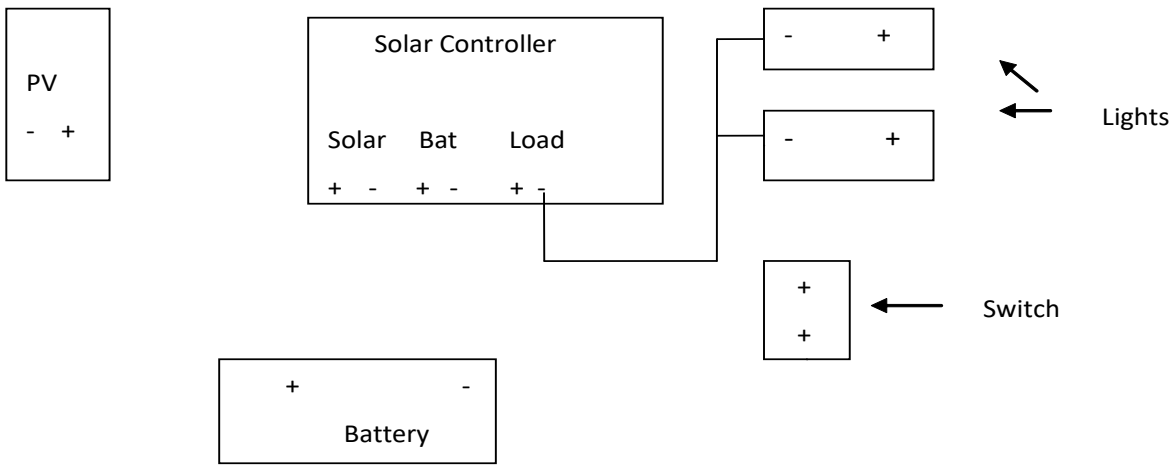


Figure 3: Wiring Diagram of 1 module 2 lights Solar Home System

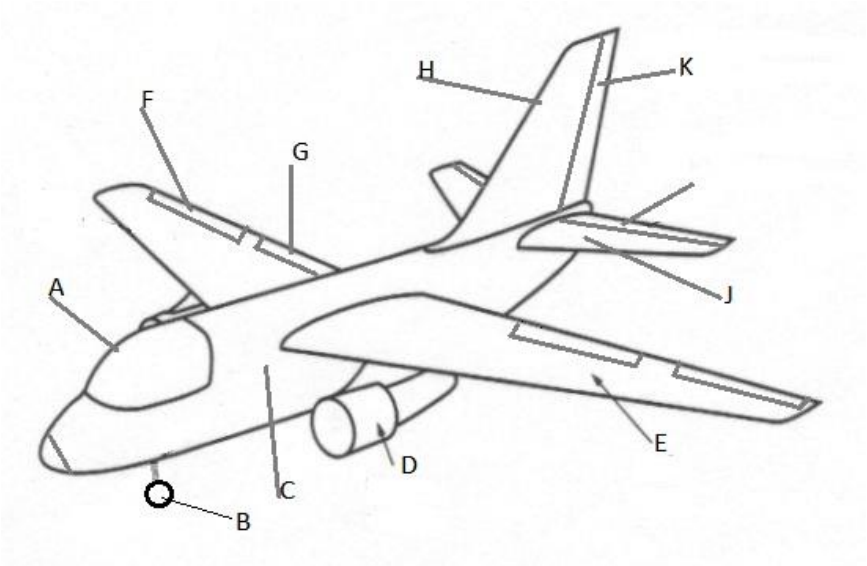


Figure 6

Q20 State the names of the parts of figure 6 as indicated in the table below ***(10 marks)***

LABEL	***Name***	***LABEL***	***Name***
A		*F*	
B		*G*	
C		*H*	
D		*J*	
E		*K*	

I. A. Edwin
A.Agyei-Agyemang