

BUNAMFAN CLUSTER EXAMINATION – 2022

Kenya Certificate of Secondary Education

447/1 – POWER MECHANICS – Paper 1

June 2022 - 2 1/2 hours

Name.....Adm No.....

Class..... Date.....

Instructions to candidates

- Write your name and admission number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- Candidates should have the following for this examination:
 - Drawing instruments;
 - Scientific calculator
 - Drawing paper size A3.
- This paper consists of *two* sections; *A* and *B*.
- Answer *all* the questions in section *A* in the spaces provided.
- Answer question 11 on A3 paper and any other three questions from section B in the spaces provided.
- All dimensions are in millimeters unless otherwise stated.
- This paper consists of printed pages.*
- Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.*
- Candidates should answer the questions in English.*

For Examiner's Use Only

| Section | Question | Maximum Score | Candidate's Score |
|---------|----------|--------------------|-------------------|
| A | 1 – 10 | 40 | |
| | 11 | 15 | |
| | | 15 | |
| | | 15 | |
| | | 15 | |
| | | Total Score | |

SECTION A(40 marks)

Answer all questions in this section in the spaces provided

1. a) List four classes of body cuts. (4mks)



- i) _____
- ii) _____
- iii) _____
- iv) _____

b) State one safety measure that should be taken under the following circumstances.

i) Acid spills in your eyes. (1mk)

ii) Fire breaks in the workshop. (1mk)

2. Identify the following tools and state uses of each in power mechanics workshop. (4mks)

| Tool | Name | Used for |
|---|------|----------|
|  | | |
|  | | |

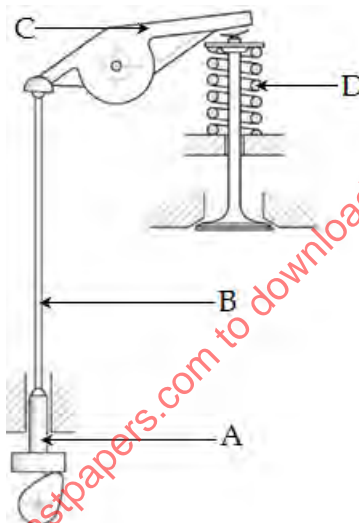
3. Give three reasons why aluminium alloys are used in making of piston. (3mks)

- i) _____

- ii) _____

- iii) _____

4. The diagram below shows an engine system. Use it to answer the questions that follows.



a) Name the system. (1mk)

b) On the diagram, use an arrow to show where valve clearance is measured. (1mk)

c) Name the components labeled A and B. (2mks)

i) A _____

ii) B _____

d) State the functions of components C and D. (2mks)

i) C _____

ii) D _____

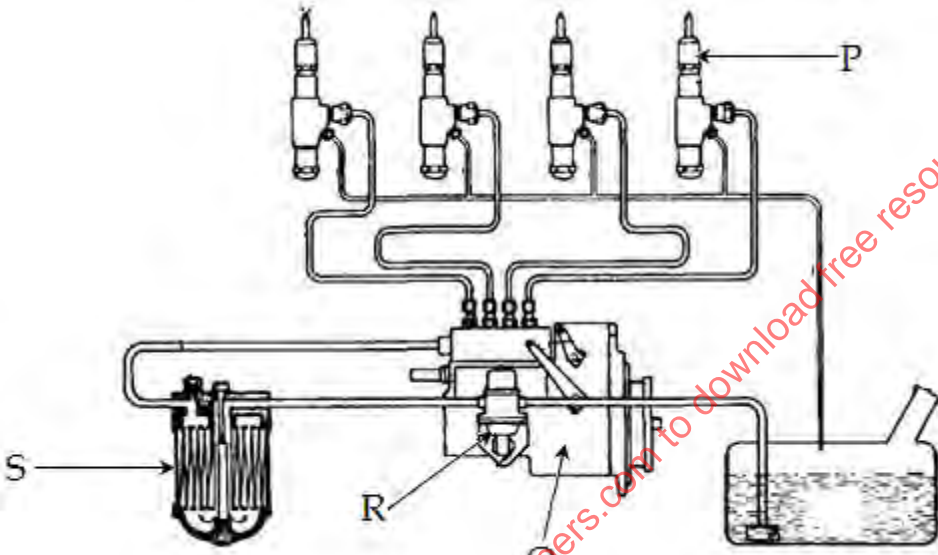
5. Explain two reasons why choke valve should be opened immediately after the engine starts.

(2mks)

i) _____

ii) _____

6. Use the diagram below to answer the questions that follows.



a) On the diagram, indicate the direction of fuel flow. (2mks)

b) Name the parts labeled P, Q, R and S. (4mks)

i) P _____

ii) Q _____

iii) R _____

iv) S _____

7. State three permanent metal joining processes. (3mks)

i) _____

ii) _____

iii) _____

8. In the space provided below, draw a three phase diode rectification diagram. (3mks)

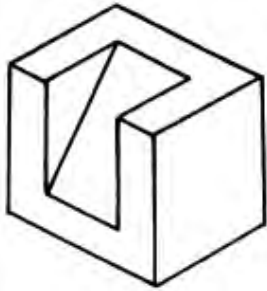
9. Explain the following terms as used in spark plug. (3mks)

i) Heat range _____

ii) Spark plug reach _____

iii) Spark plug diameter _____

10. Sketch in first angle orthographic views of the following pictorial drawing. (4mks)

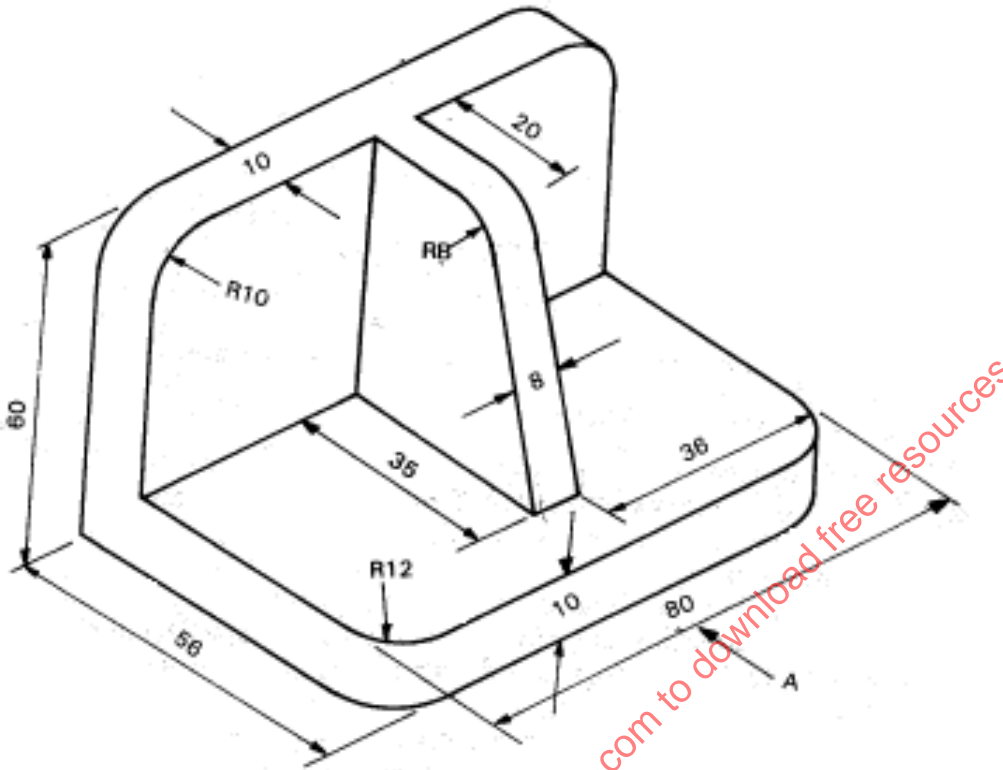


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SECTION B (60 marks)

Answer **question 11** on A3 paper provided and any other **three** questions from this section in the spaces provided. Candidates are advised to spend **not more than 25 minutes** on question 11.

11. The following is a machine block drawn in isometric projection.



Draw the following views in first angle orthographic projections.

(15mks)

- i) Plan
- ii) Front viewed from direction A
- iii) End view

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12. a) Explain the following activities in a diesel engine: (4mks)

i) Induction stroke _____

ii) Exhaust stroke _____

iii) Compression stroke _____

iv) Power stroke _____

b) State three advantages of a rotary engine as compared to reciprocating engine.(3mks)

i) _____

ii) _____

iii) _____

c) Explain the functions of the following engine parts; (4mks)

i) Recoil starter _____

ii) Power take – off shaft _____

iii) Automatic advance _____

iv) Dip stick _____

d) Explain the meaning of the following terms; (4mks)

i) Lean mixture _____

ii) Rich mixture _____

iii) Over square engine _____

iv) Under square engine _____

13. a) Identify two precautions to be observed when handling each of the following equipment in a workshop. (6mks)

i) Gas cylinders _____

ii) Hoses and connections _____

iii) Torches _____

b) Define backfire in oxy-acetyline welding. (1mk)

c) With the aid of diagrams differentiate between leftward and rightward welding techniques. (8mks)

14. a) State four factors which are considered when selecting oil for use in a particular engine. (4mks)

- i) _____
- ii) _____
- iii) _____
- iv) _____

b) List and explain four types of engine lubrication. (4mks)

- i) _____

- ii) _____

- iii) _____

- iv) _____

c) With aid of a sketch, explain how oil pressure indicator light operates. (7mks)

15. Use a neat diagram to show the construction and explain operation of a voltage regulator. (15mks)

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