

NKOKO

MVM - Hydraulic Pneumatic

T051

Thursday, 31/10/2013

8:30 - 11:30 AM

WORKFORCE DEVELOPMENT AUTHORITY



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2013,
TECHNICAL AND PROFESSIONAL TRADES**

EXAM TITLE: Hydraulic Pneumatic
OPTION: Motor Vehicle Mechanics (MVM)
DURATION: 3 hours

INSTRUCTIONS:

The paper contains **Three (3)** Sections:

Section **I:** Fifteen **(15)** questions, **all Compulsory.** **55marks**

Section **II:** Five **(5)** Questions, **Choose any Three (3)** **30marks**

Section **III:** Three **(3)** Questions, **Choose any One (1)** **15marks**

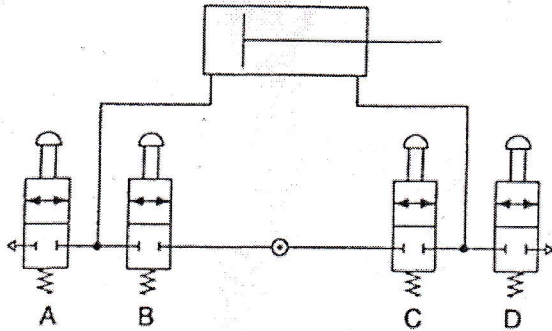
Section I: Answer all the 15 questions.55marks

01. Show a circuit operated by means of 2/2 valves. State which valves need to be operated to:

a) advance the piston

b) retract the piston

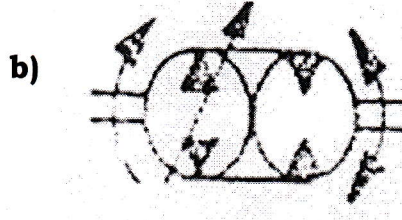
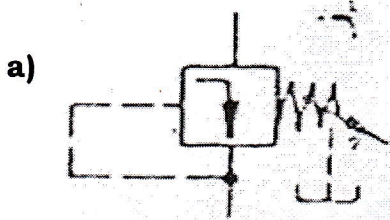
4marks



02. How is the strength of braking down to the brakes of wheels? **4marks**

03. Give the group of braking systems which are found on a vehicle with trailer. **4marks**

04. The figure hereafter shows symbols which represent the components parts of a hydraulic circuit. Name the two components labeled. **4marks**



05. Give the function of:

a) Check valve

b) Cylinder

2marks

06. Explain:

a) Cut off point

b) Cut in point

2marks

07. On what do you base to choose a filter? **4marks**

08. Draw the following symbols in pneumatic braking system. **4marks**

a) Solenoid valve

b) Electromagnet

c) Height- control valve with damping d) Coupling head supply for the tractor vehicle

09. List five (5) advantages for an antilock-braking system. **5marks**

10. What are the classification of brake systems according to type of energy used? **3marks**

11. Enumerate four component groups of load sensing valve in hydraulic. **4marks**

12. What pressure difference is used in the vacuum brake booster? **1mark**

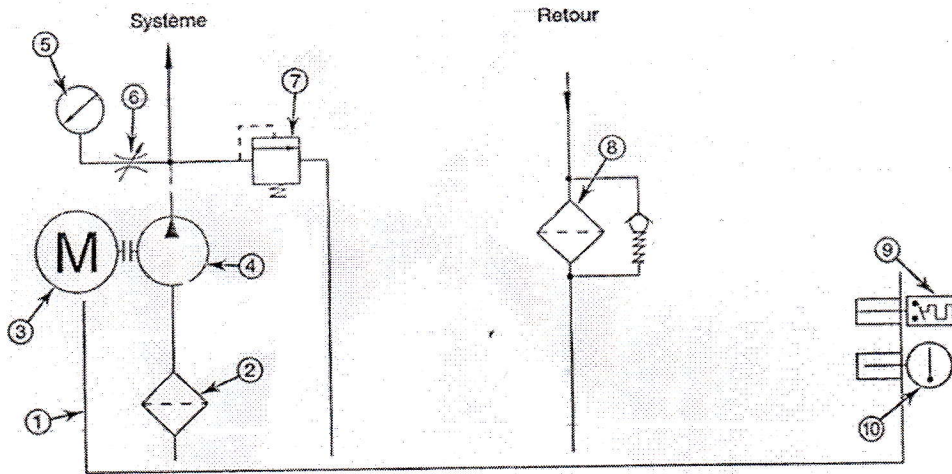
13. Give the purpose of dual-circuit protection valve in compressed-air supply. **3marks**

14. What reasons can cause damage of a hydraulic system when you make maintenance? **4marks**

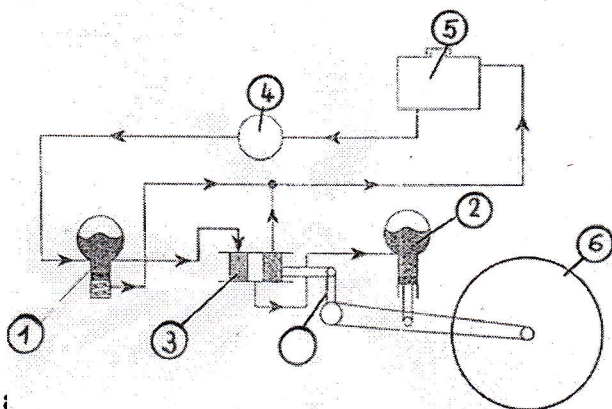
15. Draw a single- circuit, dual- line compressed air trailer power- brake system (low pressure) with mechanical parking brake. (For a gross weight of not more than 16 tones) **7marks**

Section II: Answer three questions of your choice. 30marks

16. a) When choosing a hydraulic fluid, what factors must be considered? **9marks**
 b) Define the term "fluid viscosity" **1mark**
17. Name the component parts labeled on the figure bellow: **10mark**



18. Sketch a pneumatic system which consists of basic components of a brake system, individual units represented by graphic symbols hereafter:
 a. Air compressor; Pressure regulator; Service-brake valve;
 b. Parking-brake valve; Four circuit safety valve; Air reservoir;
 c. Drain valve; Load sensing valve; Brake cylinder;
 d. Combination brake cylinder. **10marks**
19. a) What are the main parts of a rotary pump? **3marks**
 b) How does it work? **7marks**
20. The figure hereafter represents a simplified layout of hydro pneumatic suspension system.

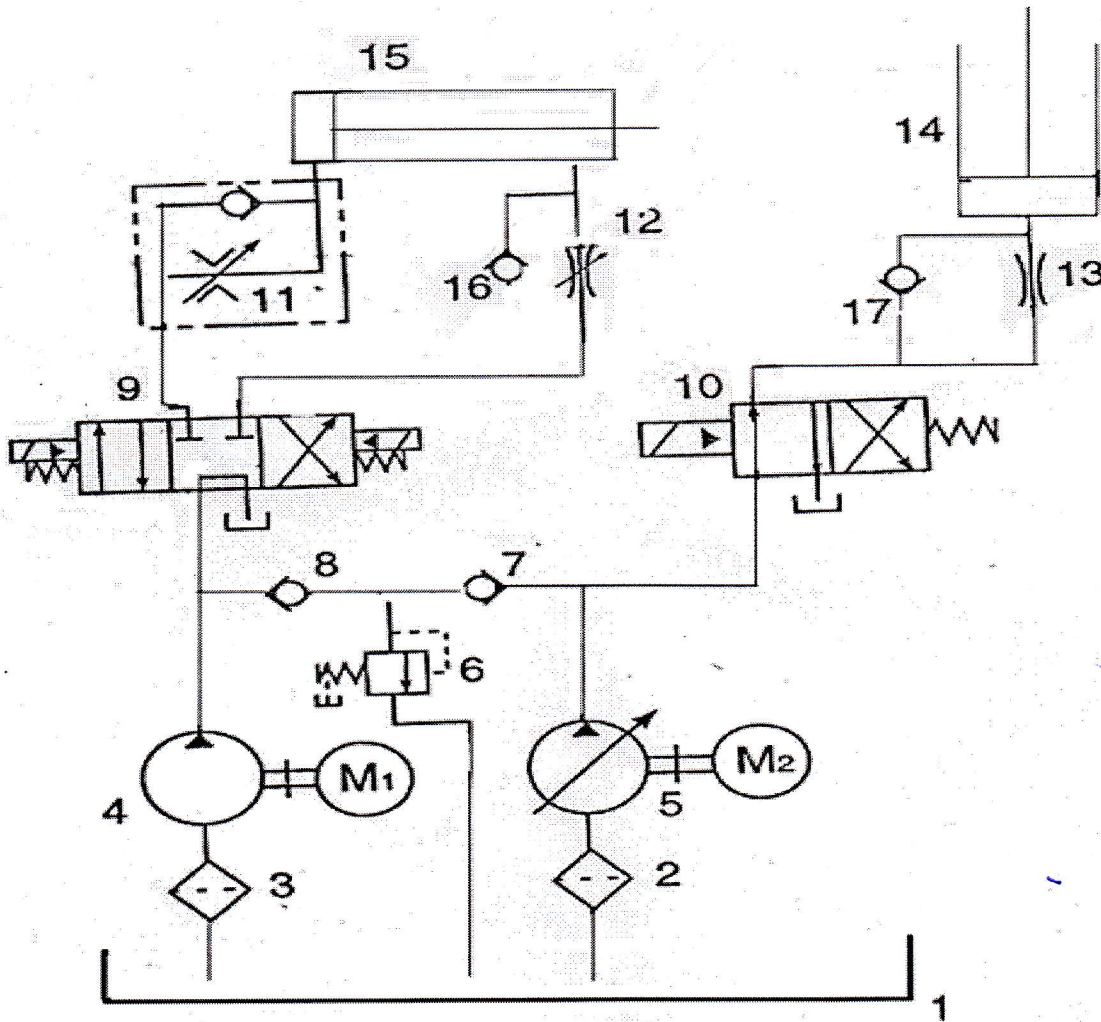


- b) What are the benefits of this system? **6marks**
4marks

Section III: Answer any one question of your choice. 15marks

21. Sketch a hydraulic system which consists of: Dual-circuit, compressed- air power-brake system (low pressure) with no-linkage parking brake for commercial vehicles without trailer with a gross vehicle weight from approx 8 to 15 tons. **15marks**

22. Below is represented a sketch of a hydraulic circuit. Identify parts 1 to 15. **15marks**



23. Mention the causes of an inoperative hydraulic system. **15marks**

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