NESA NATIONAL EXAMINATION AND SCHOOL INSPECTION AUTHORITY

ATC – Pneumatic and Air brake system maintenance

T167

Monday, 26/7/2021

08:30 – 11:30 AM

Names:.....

Index number:.....

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

QUESTIONS and ANSWERS BOOKLET

OPTION/TRADE: **AUTOMOBILE TRANSMISSION AND CONTROL SYSTEMS**

SUBJECT: **Pneumatic and Air brake system maintenance**

ACADEMIC YEAR: **2020-2021**

Read carefully the instructions on page (i) & (ii).

FOR EXAMINER'S USE ONLY

QUESTIONS	1	2	3	4	5	6	7	8	9	10	Total
Marks											
QUESTIONS	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**Total**
Marks											
QUESTIONS	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**Total**
Marks											

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

INSTRUCTIONS TO CANDIDATES: PART I (Answer Booklet)

1. A candidate should fill in the actual names and the index number on the cover of this questions and answer booklet on the provided place (Black Box).

2. It is illegal for a candidate to write any of his/her names, index number or a school name inside the answer booklet.

3. A candidate should check if all pages of the answer booklet are complete. No candidate should remove or tear any pages or part of it from the answer booklet.

4. A candidate should answer in the language in which the examination is set. (See page ***(ii)***)

5. A candidate should sign on the sitting plan when submitting the answer booklet. He/she has also to check if the answer booklet is well sealed.

6. No extra paper is allowed in the examinations room. If a candidate is caught with it his/her results will be nullified.

7. No candidate is allowed to write answers not related to the subject being sat for, otherwise it will be considered as a cheating case.

8. Write your answers on the 12 lined pages (From page 1 of 12 to page 12 of 12).

9. Use the last non-lined pages as draft.

10. Results for any candidate who is caught in examination malpractices are nullified. The cheating can be recognized during examinations administration, marking exercise or even thereafter.

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

OPTION/TRADE: **AUTOMOBILE TRANSMISSION AND CONTROL SYSTEMS**

SUBJECT: Pneumatic and Air brake system maintenance

DURATION: 3 hours

INSTRUCTIONS TO CANDIDATES: PART II (Question paper)

The paper is composed of two (2) Sections as follows:

Section I: Attempt all the Twelve (12) questions **(60 marks)**

Section II: Attempt any Four (4) questions out of Six (6)

(40 marks)

Allowed materials:

- Ruler or square
- Calculator

Note:

Every candidate is required to carefully comply with the provided assessment instructions.

Section I : Attempt all the Twelve (12) questions (60 marks)

1. Write these terms in full words:

a) ABS

b) TCS

c) BAS

d) FRL **(5 marks)**

2. **a)** State the Pascal's law in fluid power

b) Define:

i) PLC

ii) Beta ratio. **(5 marks)**

3. State the properties and composition of air. **(5 marks)**

4. Indicate the meaning of the following connection designations used in the graphic symbols: 0, 1, 3, 7, and 9. **(5 marks)**

5. Mention the advantages of air brake in vehicle. **(5 marks)**

6. What are the graphic symbols of the following devices?

(a) Air receiver

(b) Automatic drain valve

(c) Monitoring switch

(d) Compressor

(e) Antifreeze pump. **(5 marks)**

7. What are the advantages of water cooled heat exchanger over air cooled heat exchanger? **(5 marks)**

8. A volume $0.5m^3$ of air at gauge pressure of 1500kpa (15bar) is allowed to expand in a cylinder until volume is $2m^3$; if the temperature is constant, what is the new gauge pressure? Assume the atmospheric is 100kpa (1bar). **(5 marks)**

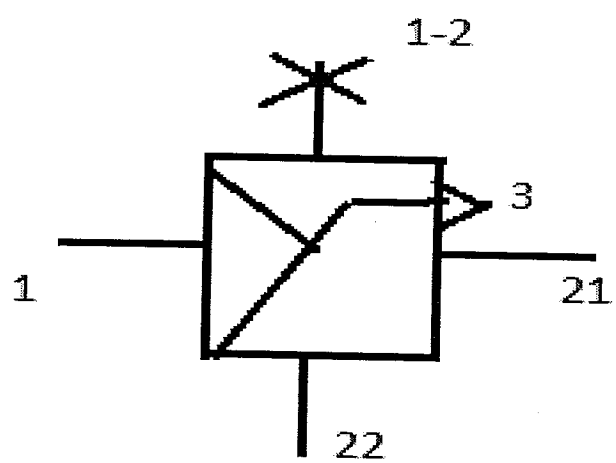
9. List any five (5) advantages for an anti-lock braking system.

(5 marks)

10. For choosing a hydraulic fluid, what factors must be considered? **(5 marks)**

11. Explain why a truck braking system with compressed air is always used instead of hydraulic system. **(5 marks)**

12. Explain the meaning of the digit numbers presented on the symbol below.



(5 marks)

Section II: Attempt any Four (4) questions out of Six (6)

(40 marks)

13. a) State the Boyle's Law, Guy Lussac's Law

b) Define the pressure Dew point and enumerate the factors that effect dew point. **(10 marks)**

14. State and explain the classification of air brake system. **(10 marks)**

15. A quantity of gas at pressure of 720mmhg and temperature of 17^{0}C occupies a volume of 2,4 liters. Reduce the volume of gas to STP. **(10 marks)**

16. List down the pneumatic component groups and purpose of each group. **(10 marks)**

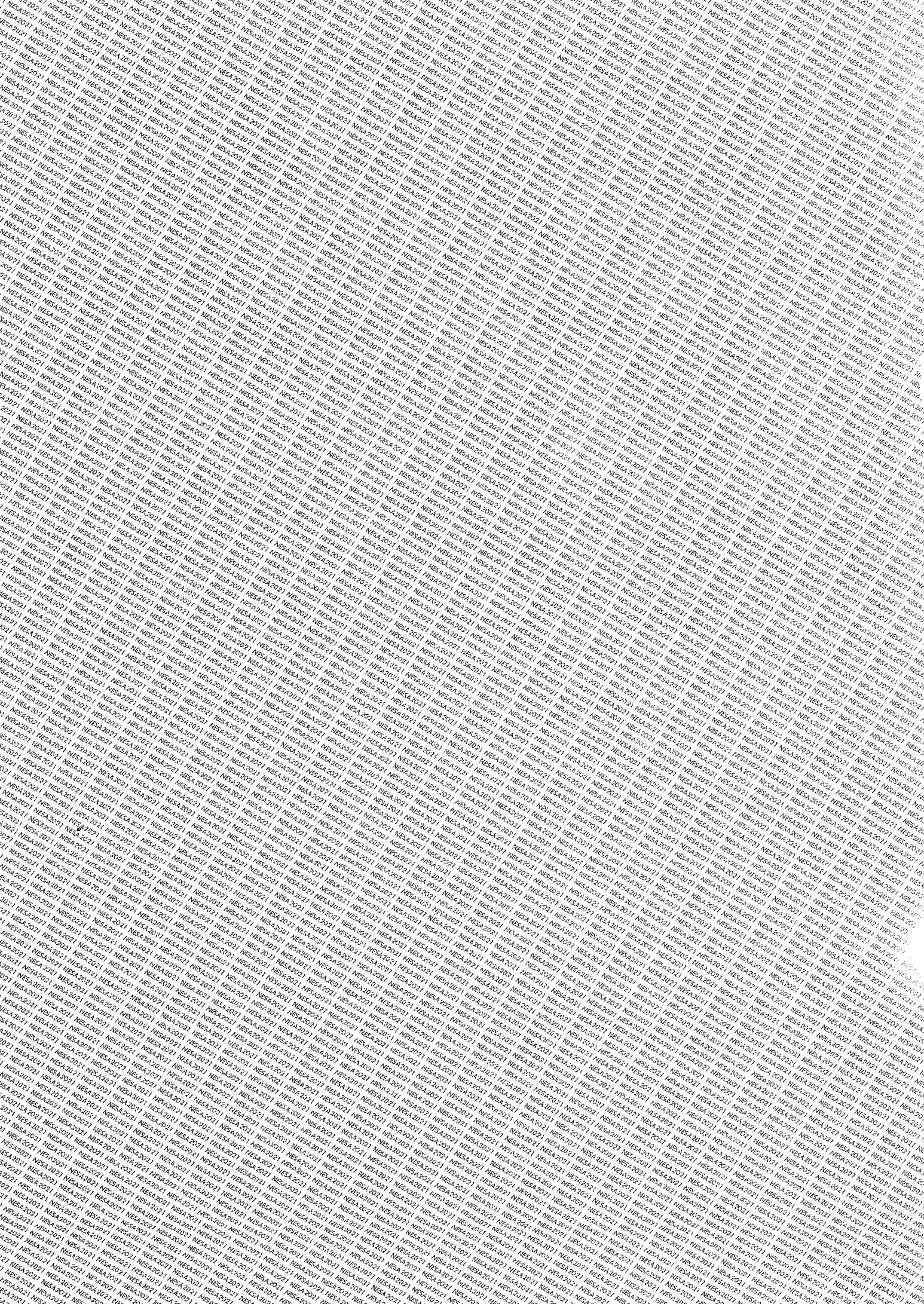
17. With neat sketch describe the working principle of the air compressor used in air brake system. **(10 marks)**

18. What will be the possible causes and remedies of the troubles below in pneumatic brake systems? **(10 marks)**

a) Pump makes noise

b) Pump oil over-heated

Do not write anything on this page !


NESA2021