NAME…….. INDEX NO ……ADM.NO…….
CLASS……CANDIDATES SIGNATURE ……. DATE……

447/1
POWER MECHANICS
TIME: 2 ½ HRS

KAMDARA JET - 2016

INSTRUCTION TO CANDIDATES

1. Candidates should have the following materials for this examination:
i. Drawing instruments
ii.A4 drawing papers
2. This paper consists of two sections; A & B
3. Answer all questions in section A in the spaces provided. Answer question 11 on drawing paper size A4 and any other three questions from section B in the spaces provided.
4. All dimensions are in mm.
5. Candidates should check the question papers to ascertain that all pages are printed as indicated and that no questions are missing.

FOR EXAMINER'S USE ONLY

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-10	40	
B	11	15	
	12	15	
	13	15	
	14	15	
	15	15	
	TOTAL	**100**	

SECTION A (40 marks)

Answer all questions in this section.

1. (a). Define the term power mechanics (1mark)

   (b). List 2 career development opportunities available to automotive engineering diploma holders (1mark)

   i.
   ii.

   (c). List down 2 factors to consider when selecting location of automotive parts shop (2marks)

   i.
   ii.

2. (a). state 2 types of fire extinguishers used to put out fire by oil (2 marks)

   i.
   ii.

   (b). list down 2 precautions observed when saving electrocuted person in the workshop. (1 mark)

   i.
   ii.

   (c). list down 2 types of body cuts (1 mark)

   i.
   ii.

3. The nominal size of gudgeon pin is 50mm if tolerance is ± 0.05mm.calculate its limits (3mks)

   (b). Distinguish between interference fit and clearance. In each case state an application in engine assembly. (3marks)

4. Name the types of locking devices used in each of the following vehicle components 3mks

   (i). big end bearing cap

   (ii). Cylinder head/cylinder block

   (iii). Valve/tappet clearance assembly

5. State 2 characteristics of a good soldering flux (1mk)

(b). state 1 disadvantage of using acid flux in soldering (1mk)
i.

(c). list down 2 types of oxy-acetylene flames (1mk)
i.

ii.

6. Differentiate between radial types and cross ply (1mk)

(b). Illustrate 2 types of tyres treads patterns and in each case state its applications (2mks)

(c). Illustrate 2 types of alloy steel profiles used to manufacture (make) chassis frame. In each case state load resisted by each (3mks)

7. State two causes of low engine oil pressures (1mk)

(b). List down 2 major classifications of vehicle greases (1mk)

(c). List down 2 types of dry lubricants used in vehicle application (1mk)

(d). List down 2 types of volatile materials used in vehicle application (1mk)

8. Explain each of the following terms as applied to engine operations 3mks
(i). valve overlap

(ii). Valve lag

(b). Differentiate between over square and under square engine (2mks)

9. Sketch a bearing and shaft assembly to illustrate how each of the following load is supported
(i). radial loads

(3mks)

(ii). Thrust loads

10. List down 2 basic circuits of carburetor (1mk)

(b). state cause of the following carburetor faults (2mks)

(i) Flooding

(ii) Stalling during acceleration

SECTION B (60marks)

Answer question 11 and any other 3 questions from this section. Candidates are advised to spend not more than 25minutes on question 11.

11. Figure below is an isometric pictorial drawing of bearing bracket. Draw In first angle orthographic projection.
(i). section front view in the direction A-A
(ii). Plan view of bracket 15 marks

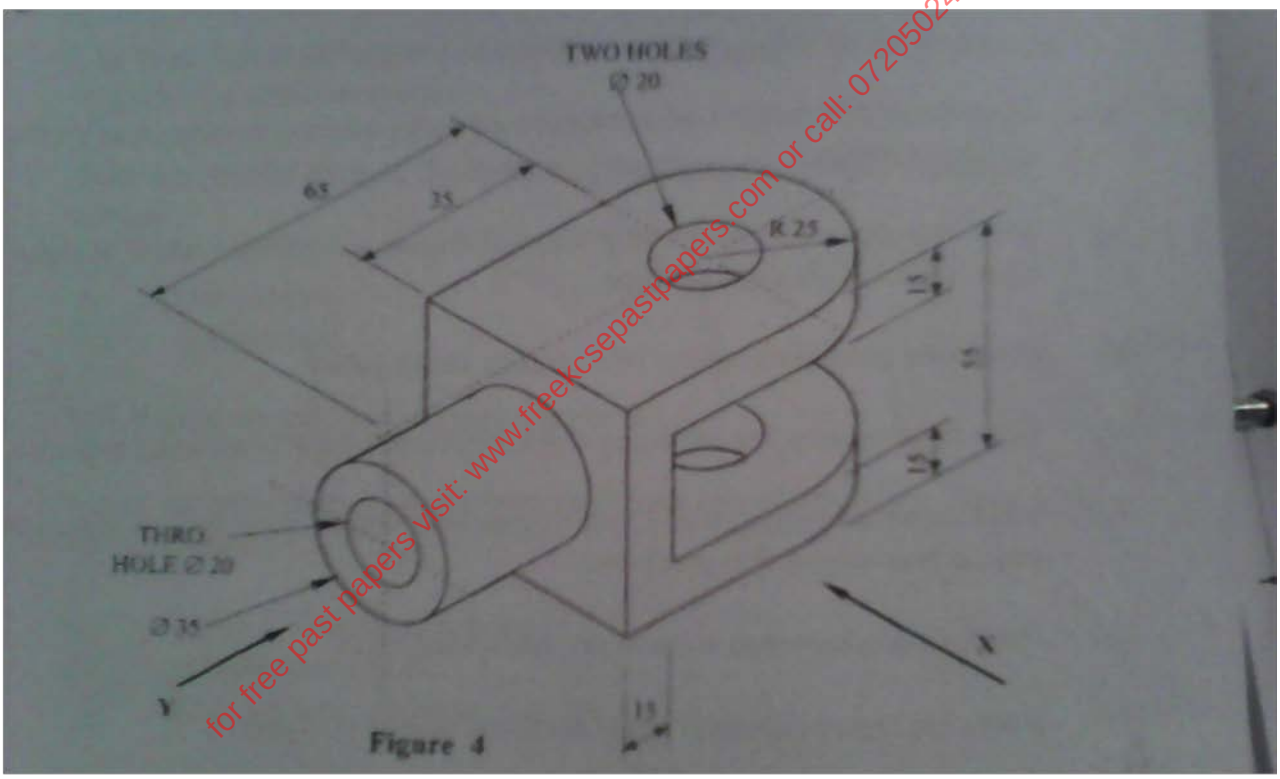

Figure 4

12. State 2 reasons why leaded fuels are not used in vehicle engines. (2mks)

(b). Define term cetane number (1mk)

(c). with aid of a labeleddiagram, illustrate CI fuel system (8mks)

(d). Outline how system operates . (4mks)

13. State 3 advantages of pneumatic brakes/air brakes over hydraulic brakes (3mks)

(b). state function of the following components in a vehicle hydraulic brake system (2mks)

(i). brake servo

(ii). Pressure limiting valve

(c). with aid of labeled sketches, explain operation of leading drum brake assembly (10mks)

14. State causes and remedy of the following gearbox faults (2mks)

(i). sticking selector fork

(ii). Noisy reserve gear

(b). state the function of the following gearbox components (2mks)

(i). synchronizer ring

(ii). Idler gear

(c). the section view shows a drawing of motor vehicle clutch

i.namelabeled parts A B C D E F 3mks ii.explain operation of clutch 8mks

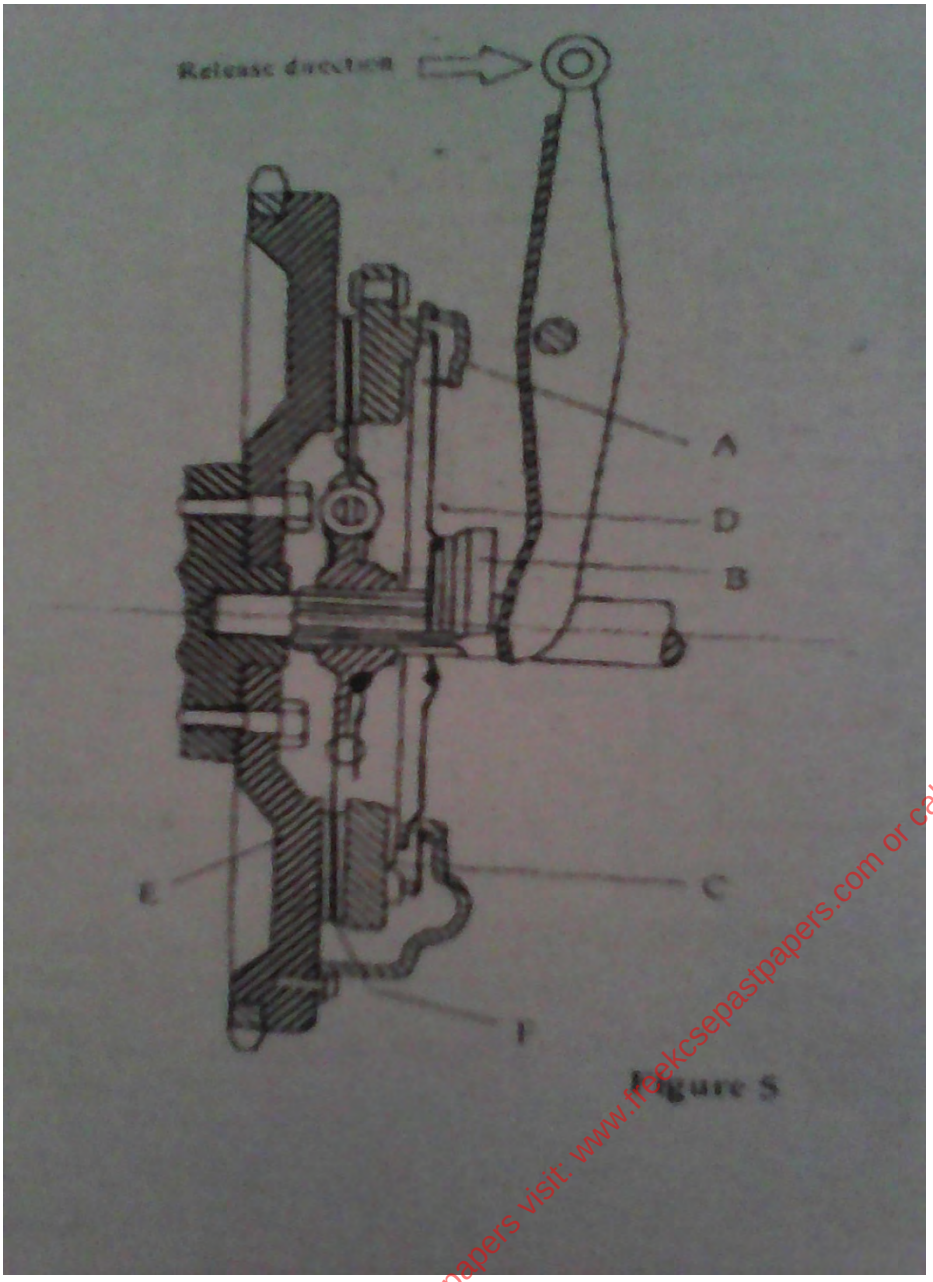

Figure 5

15. Differentiate between wheel balancing and wheel alignment (2mks)

(b). with aid of sketches explain the following angles used in steering geometry (9mks)

(i). positive camber

(ii). Positive castor

(iii). Kingpin inclination

(c). state 2 checks/corrections that is done before wheel alignment (2mks)

(d). state 2 causes of tyres wear (2mks)