

G12 ECZ GMD PAPER 2 2017 SOLUTIONS

Grade 12 ECZ Geometrical and Mechanical Drawing Paper 2, 2017 (7040/2)

Construction/assembly methods -- this is a practical drafting exam, see note

practical drafting exam: the true answer is a full-size drawing on A2 paper. This PDF gives the exact construction/assembly method, not a rendering.

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Geometrical and Mechanical Drawing

7040/2

Paper 2

Monday

27 NOVEMBER 2017

Additional Material(s):

A2 Drawing paper (1 sheet)
Standard drawing equipment

Time: 2 hours 40 minutes

Marks: 100

Instructions to Candidates

Print your **name**, **centre number** and **candidate number** in the Title Block at the bottom right-hand side of your drawing paper.

There are **two (2)** questions in this paper. Answer **both** questions.

Use **both** sides of the drawing paper for your answers.

Information for Candidates

The number of marks is given in brackets [] at the end of each question or part question.

The insert contains **Figure 2** for Section 2.

You have an additional **10 minutes** to read carefully the text of Section 2 before answering the questions.

Arcs of circles less than **5mm radius** may be drawn freehand.

All dimensions are in millimetres unless otherwise stated.

Cell phones are not allowed in the examination room.

www.zedpastpapers.com

Section 1 (16 marks)

Candidates are advised to spend not more than **30 minutes** on this section of the paper:

1 Two orthographic views of an **ANGLE BRACKET** are shown in **Figure 1**.

Do Not copy the views but sketch freehand and in good proportion a pictorial view of the bracket with **E** in the foreground of the view.

NB: The use of instruments including any form of straight edge when sketching the view or when lining in will be heavily PENALISED.

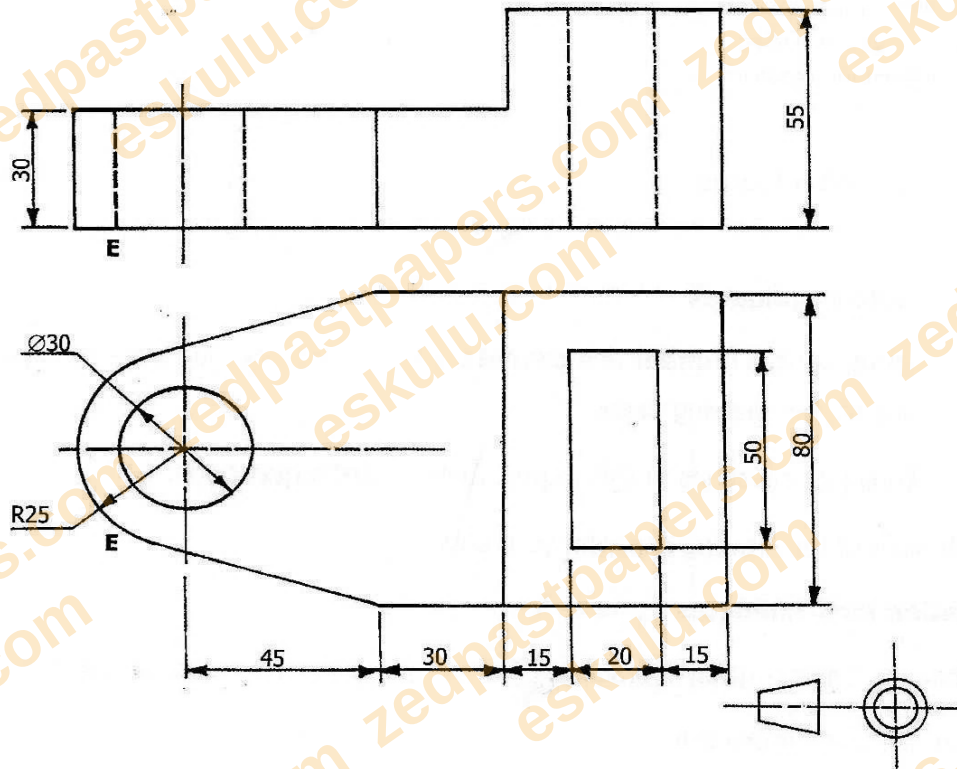


Figure 1

Section 2 (84 marks)

- 2 **Figure 2** shows in **First Angle Projection** details of the components of a **PULLEY AND BODY ASSEMBLY** which are assembled as follows:

The **Bush** ③ is inserted into the 26mm diameter hole of the **Pulley** ② until it lies flush on both ends. This sub-assembly is placed in between the bases of the **Body** ① so that 20 $\varnothing$ holes are in alignment.

The **Bolt** ④ is then inserted through the 20mm hole of the body from the left-hand side until its head is in contact with the body thereby supporting the pulley in position. The Bolt is then secured by the **Washer** ⑤ and Hexagonal **Nut** ⑥.

With the components assembled as detailed above, draw full size the following views in either **first** or **third angle projection**.

- (a) A Sectional Front elevation, with plane of section and direction of the required view being indicated at **X – X** on the end elevation .
- (b) A plan as seen in the direction of arrow **P**.

NOTE: No end elevation is required.

- Suitable dimensions should be estimated where data is not provided. No Hidden details or part lines are required in any view.
- Insert four dimensions as recommended BS 308. These should be of varied character and should include the following: length, height, diameter, details of a Nut or Bolt.

- (c) In the lower right hand side of the drawing paper and on the same side on which you have drawn the solution to question 2, draw the **Title block** and print in it the following details: the Title, your name, Examination number and scale used. Indicate by standard symbol the method of projection used.

EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Geometrical and Mechanical Drawing

7040/2

Paper 2

INSERT

www.zedpastpapers.com

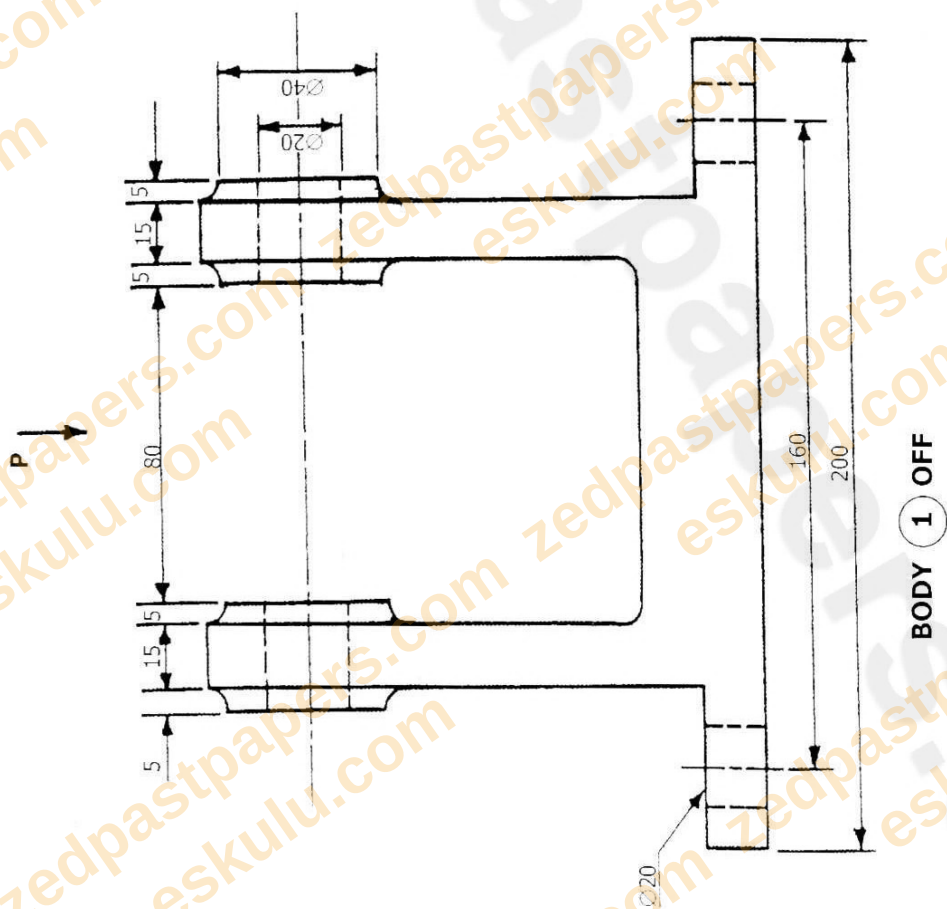
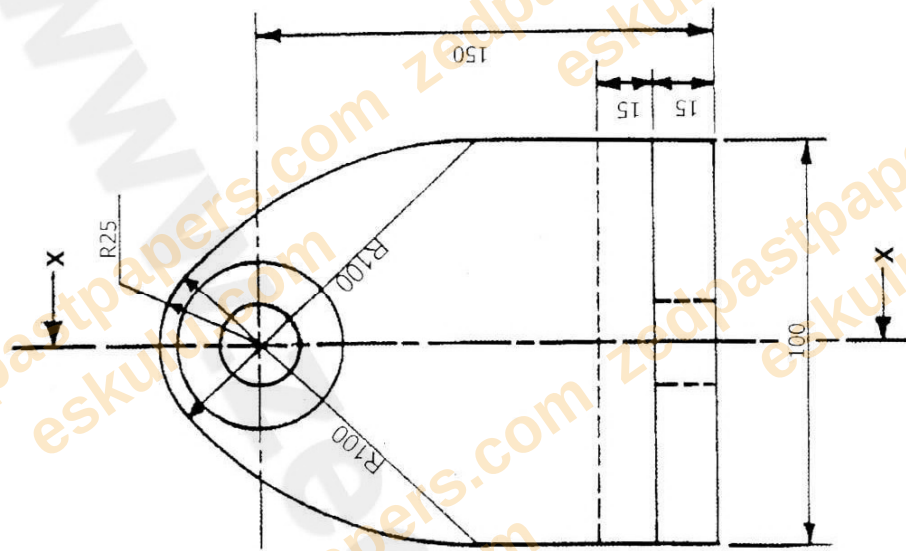
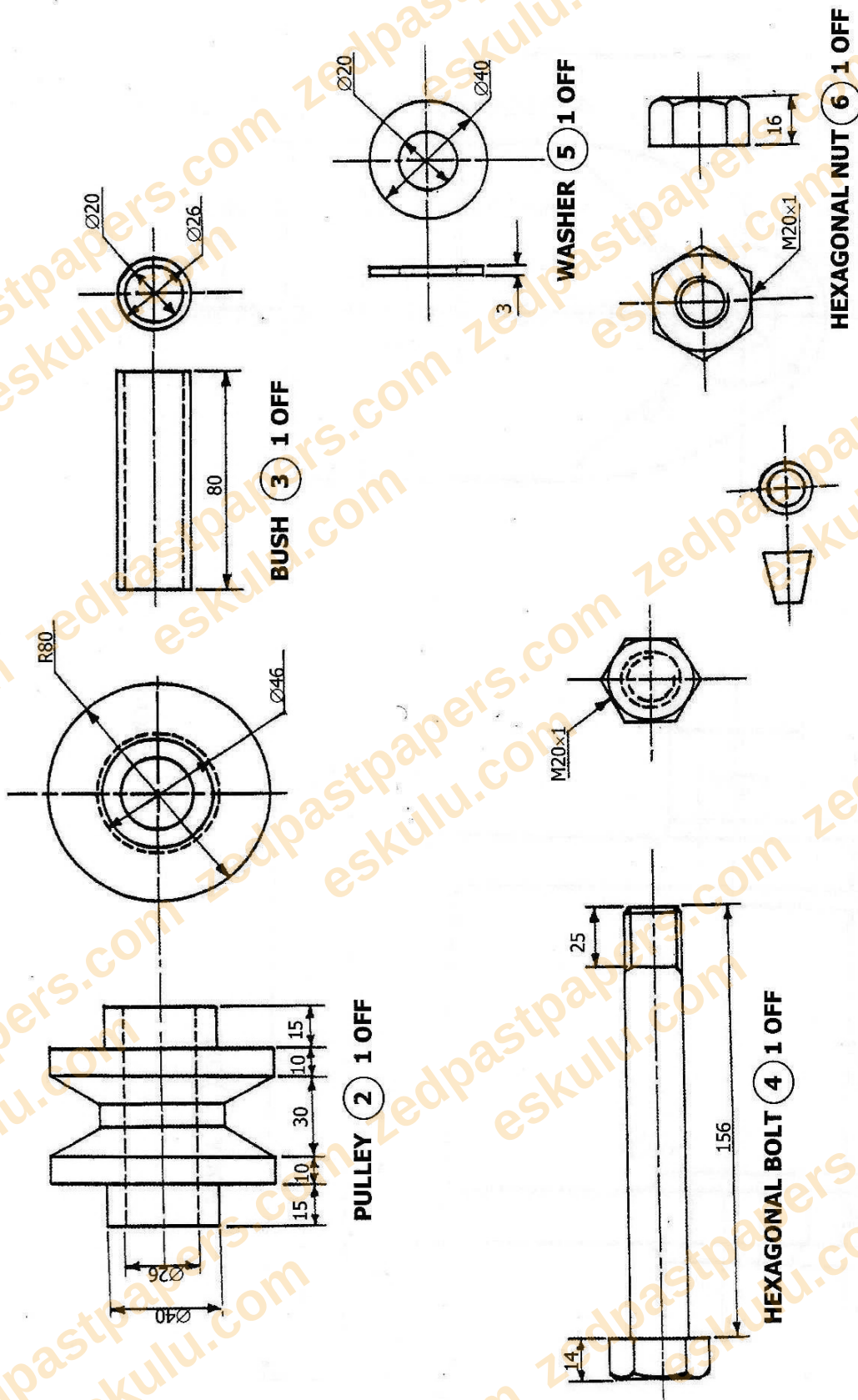


Figure 2

Geometrical and Mechanical Drawing 2 insert



Geometrical and Mechanical Drawing 2 Insert



**DOWNLOAD ECZ
PAST PAPERS
FROM YOUR
PHONE OR PC**

www.zedpastpapers.com

Question 1. SECTION 1 [16]. Figure 1 shows two orthographic views of an ANGLE BRACKET (45/30/15/20/15mm length divisions, 55/80/50mm heights, a rounded Ø30/R25 boss at the front end). Sketch freehand, in good proportion, a pictorial view with point E in the foreground, no instruments.

Method: as with the equivalent questions in other GMD papers, this tests freehand proportion, not instrument accuracy. Build a mental 3D model from the two given views: an L-shaped angle bracket with a stepped profile (30mm base rising to 55mm at one end), a rounded front boss (Ø30 bore, R25 outer radius), and a rectangular through-slot near the middle, with point E marking the rounded end nearest the viewer.

Sketch freehand (oblique or isometric-style pictorial, angles estimated by eye, NOT measured with any instrument), starting from a light freehand bounding box in the given overall proportions (length $45+30+15+20+15=125\text{mm}$, heights 30 to 80mm), blocking in the L-shaped/stepped profile first, then the rounded boss (sketched as a freehand near-circle, not compass-drawn) and the rectangular slot, keeping point E as the nearest visible feature. Per the instructions, use NO instrument at any stage (including lining-in).

Answer: Answer: correct procedure is freehand-only (no instruments), built from a light bounding box in the given proportions (overall length 125mm, heights 30-80mm, rounded boss Ø30/R25), with point E positioned as the nearest feature to the viewer.

Question 2. SECTION 2 [84]. Figure 2 (insert) shows a PULLEY AND BODY ASSEMBLY: BODY (1, with two bosses and a 20mm-diameter through-hole), PULLEY (2, with a 26mm-diameter central hole), BUSH (3), BOLT (4), WASHER (5), Hexagonal NUT (6). Assemble per the given instructions and draw, full size, in first- or third-angle projection: (a) a sectional front elevation on X-X (indicated on the end elevation); (b) a plan viewed from arrow P. Insert 4 varied BS308 dimensions (length, height, diameter, and nut/bolt details) and a title block.

Assembly logic (transcribed directly and unambiguously from the given instructions): the BUSH (3) is inserted into the pulley's (2) 26mm-diameter hole until it lies FLUSH on both ends. This bush-and-pulley sub-assembly is then placed BETWEEN the two bosses of the BODY (1), so that the bosses' 20mm-diameter holes are in exact alignment with the bush's own bore.

The BOLT (4) is then inserted through the body's 20mm hole from the LEFT-HAND side, passing through the bush, until its head contacts the body -- this supports the pulley in its correct running position between the body's bosses. The bolt is then secured on the far side by the WASHER (5) and Hexagonal NUT (6).

(a) Sectional front elevation on X-X (the section plane indicated on the end elevation, cutting through the body's two bosses and the pulley/bush assembly between them): this section must expose, in order across the width: the body's left boss, the bolt's head bearing against it, the bush seated flush inside the pulley's bore (with the pulley itself shown, its rim NOT sectioned/cut away since only the solid boss/bush material and body are cut by a plane through the bolt's axis -- actually since the cutting plane passes directly through the bolt's axis and the pulley's hub, the pulley's hub IS cut and shown hatched, while the bolt, being a fastener, is conventionally shown UNSECTIONED/in true elevation even though the plane passes through it), the body's right boss, and the washer+nut securing the bolt's right end. All cut solid body/pulley-hub material is hatched at 45 degrees; the bolt itself is left

unhatched per fastener convention. No hidden lines are required, per the instruction.

(b) Plan viewed from arrow P: shows the assembly from above -- the body's outline with its two bosses, the pulley's rim visible between them (its full diameter, as this is a plan not a section), and the bolt/nut assembly's end visible at one side.

Suitable BS308 dimensions to insert (4 required, of varied character, per the instruction): a LENGTH (e.g. the body's overall length), a HEIGHT (e.g. the body's overall height), a DIAMETER (e.g. the pulley's outer diameter or the 20mm aligned bolt holes), and bolt/nut details (e.g. the bolt's thread size and the nut's across-flats size, estimated where not given, per the instruction to estimate suitable dimensions where data is not provided). Title block (bottom-right, same side as the Q2 solution): title 'PULLEY AND BODY ASSEMBLY -- SECTIONAL ELEVATION', candidate name, examination number, scale (1:1), and the BS308 projection symbol matching whichever of first- or third-angle projection was actually used.

Answer: Answer: assembly order is Bush (flush inside the Pulley's 26mm bore) -> this sub-assembly placed between the Body's two bosses (20mm holes aligned) -> Bolt (inserted from the left through the body and bush, head contacting the body) -> Washer + Nut (securing the bolt's right end). Section X-X (through the bolt's axis) shows the body's bosses and the pulley's hub cut/hatched, with the bolt itself shown unsectioned per fastener convention; the plan from arrow P shows the assembly from above with the pulley's full rim visible between the body's bosses. No end elevation or hidden details are required, per the instructions.

Disclaimer

Created by eskulu Past Papers Tutor

These solutions were created using artificial intelligence and checked against ECZ marking guidelines. If you find an error, report it at eskulu.com/feedback.

eskulu.com | zedpastpapers.com