

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL ENGINEERING

ENGINEERING DRAWING – TIE 1002

2nd SEMESTER EXAMINATIONS APRIL/MAY 2000

Time Allowed: 4 Hours

Instructions:

Attempt 3 questions, including question 4

Draw carefully. Use the appropriate thickness of the lines

Use scale 1:1

Write your group and registration number on the right upper corner of the drawing sheet.

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- Qu. 1 Redraw the drawing shown in Fig. Q1, using your knowledge in Tangency Problems. Do not erase any constructional line. Do not dimension the drawing. [25]
- Qu. 2 Draw an isometric projection of the component shown in Fig. Q2. Orient the drawing so that the axis of the hole $\varnothing 60$ to be parallel to axis X. [25]
- Qu. 3 Fig Q3 shows a Hopper, opened at the ellipse and the hexagon. Plot the development of the surface of the Hopper. Open the development along the shortest generating line of the surface. Divide the circumference of the ellipse on 24 equal parts and indicate all points involved in the development when you find the true lengths. You are allowed to develop $\frac{1}{2}$ of the pattern and to indicate the axis of symmetry. [25]
- Qu. 4 Fig. Q4 shows a partly dimensioned drawing of a shaft. You must draw a sectional view of the shaft and the components assembled on it. The components are as follows:
- two ball bearings SKF 6006
 - a spur gear – $Z = 38$ and $m = 4$ mm, the configuration of which is shown in Fig Q4
- The completed drawing must show:
- selection of key dimensions
 - local sections of the shaft where necessary
 - selection of basic dimensions of the bearings. The left hand side bearing must be drawn in full sectional view, while the second one must be presented conventionally
 - calculations of outside diameter, pitch diameter and inside diameter of the gear
 - selection of fits and tolerances as follows: on $\varnothing 20$, $\varnothing 30$ and $\varnothing 35$ – interference fit. Indicate the fits on the drawing and show their tolerances beside the assembly drawing.

For all data needed see Tab. Q4

- Draw a title block and letter it properly.

[50]

Please turnover for drawings.

(Sorry the Diagrams were given as hard copies)

End of Exam