Important Instructions to examiners:

1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
3) The language errors such as grammatical, spelling errors should not be given more importance (Not applicable for subject English and Communication Skills.
4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate’s answers and model answer.
6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate’s understanding.
7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q 1 a) Conventional representations

Pulley in section

Check valve

Splined shaft

Compression spring with circular section

Spur gear

Saddle key

or
SUMMER- 14 EXAMINATION
Model Answer

Subject Code: 17305

Cross pipe joint

External screw thread

(02 marks each for correct representation, any six)

Q 1 b) a) Symbols (01 mark each)

i) Fillet weld

ii) Single V butt

iii) Single bevel butt

iv) Spot weld
SUMMER-14 EXAMINATION

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Model Answer

Q 1 b) b) Fit type

Marks: Calculation of Hole & Shaft sizes: 02 Marks & Decide type of fit: 02 Marks

Hole size: max dia 35.02 mm & min 35.00 mm
Shaft size: max dia 34.98 mm & min 34.96 mm
Max allowance = max hole size – min shaft size
= 35.02 - 34.96 = + 0.06
Min allowance = min hole size – max shaft size
= 35.00 - 34.98 = + 0.02
Hence, the type of fit is CLEARANCE FIT

Q 1 b) c) Meaning of symbols (01 mark for each meaning)

2 indicates machining Allowance as 2 mm
8 indicates Roughness value $R_a$ as 8 microns
0.8 indicates sampling length

Grinding: It is the Manufacturing Process
SUMMER-14 EXAMINATION

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Q 2 a) : Auxiliary view

Front view : 06 Marks  Top View : 04 Marks  Aux. View: 02 Marks

( Assume suitable dim wherever not given & For clarity in solution projection lines are not shown)
Q 2 b) a) Calculation of tolerance for basic size 50 to 80 mm

For answers of D, i, IT8 and IT12 each 1 marks

The shaft size is in the basic step, 50 to 80 mm and the geometrical mean

\[ D = \sqrt{50 \times 80} = 63.2 \text{ mm} \]

The tolerance unit, \( i = 0.25 \times 63.2 + 0.001 \times 63.2 = 1.853 \text{ microns} \)

For grade IT8, the formula is IT8 = 25 i

\[ = 25 \times 1.853 = 46.33 \text{ microns} \]

For grade IT12, the formula is IT12 = 160 i

\[ = 160 \times 1.853 = 296.48 \text{ microns} \]

Q 2 b) b) Two M.S. Plates of 8mm thickness and weld leg length 8mm (04 marks)
(Any one solution may be given due credit)

\[ \text{Leg length of fillet weld which is given as 8mm} \]

Q 2 c) Symbols: 01 mark for each symbol

i) Flatness

\[ \text{Flatness symbol} \]

ii) Cylindricity

\[ \text{Cylindricity symbol} \]
iii) Position

iv) Parallelism

Q3 a) Problem on Cone & cylinder
For Front view: 04, Top view: 04 & Side view: 02 Marks
Q3 b) Problem on sq. Prism & cylinder
For Front view: 04, Top view: 04 & Side view: 02 Marks
Q3 c) Problem on sq. Prism & Sq. Prism
For Front view: 04, Top view: 04 & Side view: 02 Marks
Q 4 a) Assembly of Oldham's Coupling
( Dia 106 not given. Due credit may be given for suitable assumption )
For Sect Front View : 10 Marks , LHSV: 06 Marks BoM: 02 Marks Fits: 02 Marks
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Q 4 b) Assembly of Pipe Vice

For Sect Front View: 16 Marks, Overall Dim: 02 Marks, Parts on View: 02 Marks

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Q 5 a) Details of Piston & Connecting Rod
For Piston: 07 Marks, Con Rod: 07 Marks, Big end bolt: 02 Marks, Castle Nut: 02 Marks, Gudgeon pin: 02 Marks

TOLERANCE CHART

<table>
<thead>
<tr>
<th>Tolerance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>20H7</td>
<td>+0.021</td>
</tr>
<tr>
<td>20G5</td>
<td>-0.007</td>
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Q 5 b) Details of Drill Jig (For details 1 to 3, 4 marks each, for 4 & 5, 2 marks each, for 6 to 9, 1 mark each)
(Few dimensions are not given. Due credit may be given for suitable dimensions)