



Name :
Roll No. :
Invigilator's Signature :

CS/B.Tech /APM/SEM-7/APM-706/2012-13

2012
DESIGN CONCEPT OF APPAREL MACHINERY
AND EQUIPMENT

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.

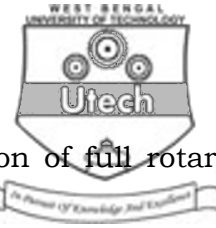
GROUP - A
(Multiple Choice Type Questions)

1. Answer the following questions :

A) Choose the correct alternatives for the following.

5 × 1 = 5

- i) Cutting needles are used mainly for
a) Cotton fabric b) Synthetic fabric
c) Leather sheet d) None of these.
- ii) Ball point needle is mostly used for
a) Leather sheet b) Polyolefin sheet
c) Knitted fabric d) Woven fabric.
- iii) Decorative chain stitch is a class of
a) 100 b) 200
c) 300 d) 400.
- iv) Long groove in needle is designed
a) to minimize fabric damage
b) to minimize stitching yarn abrasion
c) to facilitate easy unwinding from package
d) none of these.



- v) Which of the following is a function of full rotary hook in case of SNLS machine ?
- Supply of upper thread
 - Scooping of upper thread
 - Tension adjustment
 - Controlling needle movement.
- B) Match the columns (with nearest matching) : 5

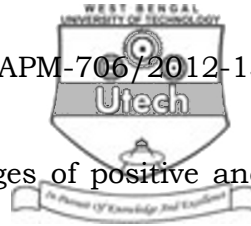
Column A		Column B	
a) Stitch Length variation		p) Full Rotary Hook	
b) Stitch number 100		q) Link Mechanism	
c) Differential bottom feed		r) Feed Dog Vertical bar	
d) Sewing Thread tension		s) Interlocking between front & back thread	
e) Thread scooping		t) Fabric weight	
f) Bevel Gear		u) Feed Dog Frictional force	
g) Thread take up lever		v) Chain stitch	
h) Stroke of Needle Bar		w) Gathers	
i) Lock stitch Mechanism		x) Seam Puckering	
j) Fabric Slippage shaft		y) Speed ratio between Hook shaft & Main	

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Discuss the importance of tensioner in sewing machines. What are the criteria to select a good quality tensioner ?



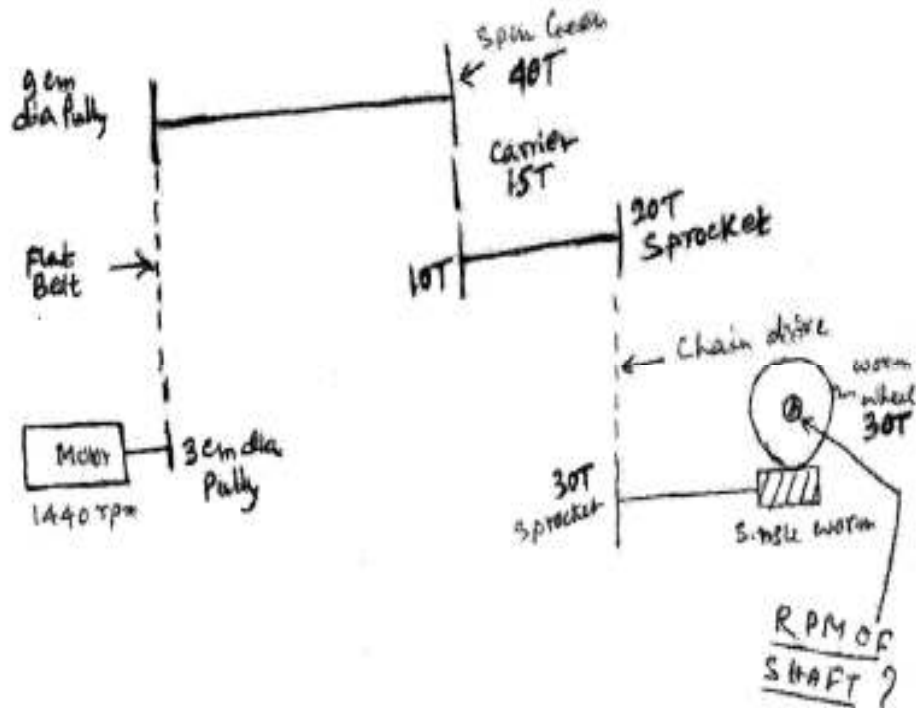
3. What are the advantages and disadvantages of positive and negative motion translation systems ? Give example.
4. What are the functions of a cam ? What are the different types of positive cam ? How does it differ from negative cam as per application point of view ?
5. Improved type feed dog enhances stitch quality. Justify.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

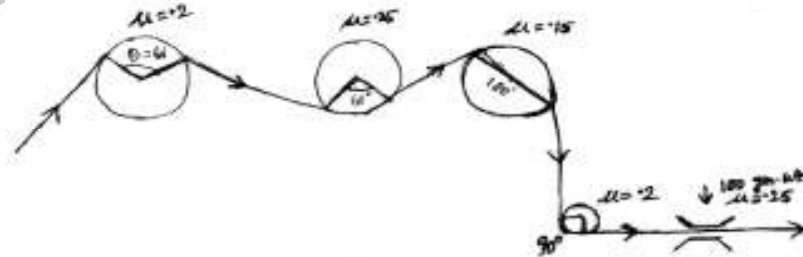
6. a) Find the RPM of the shaft from the following diagram.



If belt slippage is 29, what will be the RPM of the shaft ?



- b) Determine the output tension value from the following diagram.



Assume Input Tension = 200 Nm.

7. Construct a Cam with the following particulars :
 - a) Shaft diameter on which cam is to be mounted = 2 cm
 - b) Nearest point of contact of the treadle bowl from the centre of the cam shaft = 2 cm
 - c) Diameter of the Treadle Bowl = 2 cm
 - d) Stroke of the Cam = 4 cm
 - e) Displacement behaviour of the Treadle bowl in one complete rotation of the cam :
 - 140 degree – outward
 - 60 degree – Dwell
 - 100 degree – Inward
 - 60 degree – Dwell
 - f) Displacement profile – Linear.
8. Deduce an equation with crank & crank arm to establish needle movement is not uniform. Determine velocity & acceleration of needle with respect to crank rotation when crank RPM is w and justify requirement of this kind of behaviour.
9. Discuss about various types of feed dogs used in modern sewing machines. What are the advantages of modern feed dogs ?