



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING

DEPARTMENT OF FIBRE AND POLYMER MATERIALS ENGINEERING

TECHNOLOGY OF FABRIC MANUFACTURE II

TFE 3103

First Semester Examination Paper

December 2024

This examination paper consists of 4 pages

Time Allowed: 3 hours
Total Marks: 100
Special Requirements: Calculator
Examiner's Name: Mr. L.K. Ncube

INSTRUCTIONS

1. Answer **ALL** Questions in Section A and **ANY THREE** Questions in Section B.
2. The first fifteen minutes should be spent reading the question paper and making notes.
3. **Do not** open your answer sheet until told to do so.
4. Marks will be awarded for skill in appreciating the scope of questions, clarity of argument and conciseness of presentation as well as for the knowledge displayed by the candidate.

MARK ALLOCATION

QUESTION	MARKS
1	20
2	20
3	20
4	20
5	20
6	20

SECTION A

(Answer ALL Questions- TOTAL 40 Marks)

QUESTION 1

a. Define the following terms;

- (i.) Warping
- (ii.) Sizing
- (iii.) Weft yarn
- (iv.) Warp yarn
- (v.) Weave repeat
- (vi.) Crimp

[12 Marks]

b. Explain the difference between a negative shedding mechanism and a positive shedding mechanism. [4 Marks]

c. Calculate the weft insertion rate of a loom running at 260 picks per minute and having a reed width of 180 cm producing a 2/2 left handed twill fabric. [4 Marks]

QUESTION 2

Study the woven fabric repeat structure in **Figure Q2** and answer the following questions.

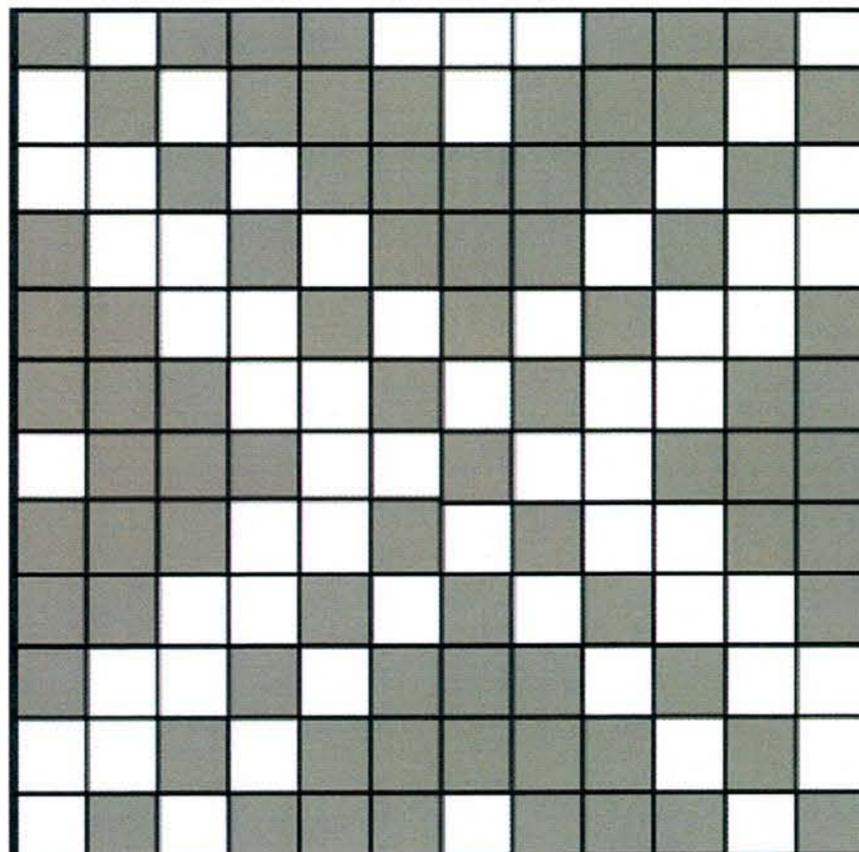


Figure Q2

- a. Determine the minimum number of shafts required to produce the fabric [7 Marks]
- b. State and justify the shedding mechanism you would employ to weave the structure [4 Marks]
- c. Explain the movement of heald shafts in order to realise the shown warp yarn interlacement [9 Marks]

SECTION B

(Answer ANY THREE Questions- TOTAL 60 Marks)

QUESTION 3

An order for a simple fabric measuring 15000 meters long and 2 meters wide is received, and the finished fabric's warp crimp is 9%, and has 15 ends per cm. The creel of direct warping process has a maximum capacity of 540 cones. The warp count is 50 tex and is available on cones with yarn weight of 2kgs. Calculate:

- a. The number of beams to be warped and the number of warp ends on each. [8 Marks]
- b. The final length of the finished warpers beam. [2 Marks]
- c. The number of packages required, and the number of creelings required to finish the order. [10 Marks]

QUESTION 4

With the aid of a clearly labelled diagram, explain the shedding mechanism of a single lift single cylinder jacquard machine. [20 Marks]

QUESTION 5

- a. Draw a fully labelled cross-sectional diagram of a weaving machine. [10 Marks]
- b. Write short notes on any four factors you would consider when deciding to set up a weaving plant. [10 Marks]

QUESTION 6

Identify the weaving mechanisms categories and explain any three functions under each

[20 Marks]

END OF EXAMINATION QUESTION PAPER