higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PATTERNMAKERS' THEORY N2

(11020532)

18 November 2020 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

143Q1E2018

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
PATTERNMAKERS' THEORY N2
TIME: 3 HOURS
MARKS: 100

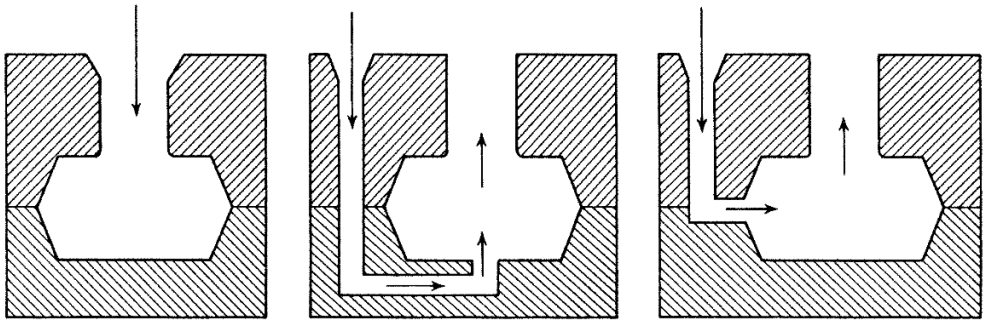
INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Write neatly and legibly.

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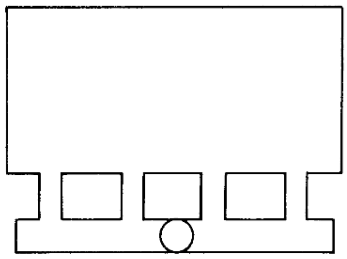
QUESTION 1

1.1 Name each of the variations in the gating positions by writing the answer next to the question number (1.1.1–1 1 3) in the ANSWER BOOK.

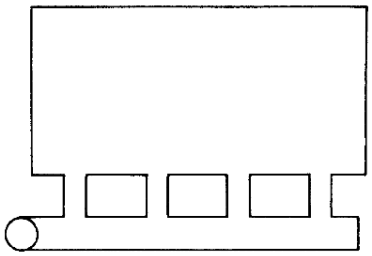


1.1.1 1.1.2 1.1.3 (3)

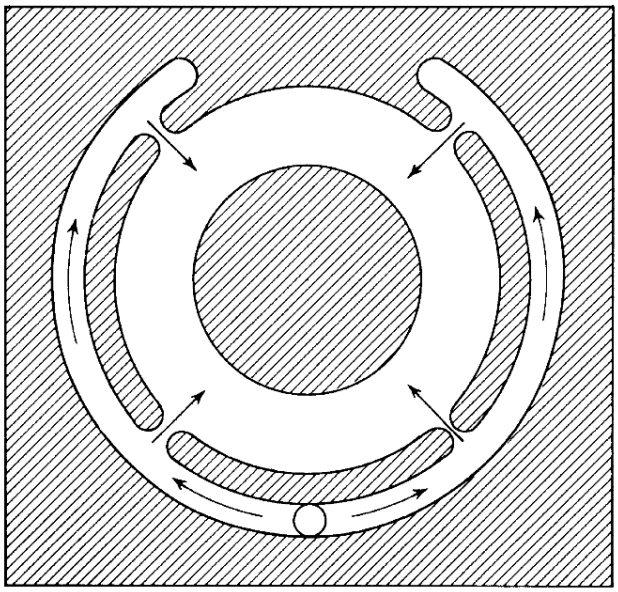
1.2 Name each of the multiple ingate systems by writing the answer next to the question number (1.2.1–1.2.3) in the ANSWER BOOK.



1.2.1



1.2.2



1.2.3 (3)

1.3 Explain the principle of directional solidification used in the feeding of castings. (14)

[20]

QUESTION 2

2.1 Describe the properties of cores. (8)

2.2 What is the difference between *shrinkage* and *contraction*? (2)

2.3 Name FOUR machines used in the pattern shop. (4)

2.4 Explain each of the following regarding a machine used for lathe work:

2.4.1 Possibilities

2.4.2 Operation

2.4.3 Control

(3 × 2) (6)
[20]

QUESTION 3

3.1 Name 30 defects in casting caused by patternmakers. (30 × ½) (15)

3.2 Name FIVE factors which affect the feeding of castings. (5)
[20]

QUESTION 4

4.1 Name TWO types of synthetic bonding materials used in the moulding process. (2)

4.2 Sketch a neat, simple gating system and name the THREE main parts. (4)

4.3 Briefly describe each of the following types of sand used in a foundry:

4.3.1 Synthetic sand

4.3.2 Dry sand

4.3.3 Black sand

4.3.4 Green sand

4.3.5 Core sand

(5 × 2) (10)

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4.4 Explain the need for a taper on a pattern. (1)

4.5 Explain the difference between the taper for a *wooden pattern* and a *metal pattern*. (3)

[20]

QUESTION 5

Explain each of the casting defects below under the following headings:

- Appearance
- Cause
- Remedy

5.1 Blow holes – entrapped air

5.2 Contraction cracks

(2 × 10) **[20]**

TOTAL: 100

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