



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES**

**DEPARTMENT OF CLINICAL HEALTH SCIENCES**

<b>QUALIFICATION: BACHELOR OF MEDICAL LABORATORY SCIENCES</b>	
<b>QUALIFICATION CODE: 08BMLS</b>	<b>LEVEL: 6</b>
<b>COURSE CODE: ANP621S</b>	<b>COURSE NAME: ANATOMICAL PATHOLOGY 2B</b>
<b>SESSION: DECEMBER 2025</b>	<b>PAPER: THEORY</b>
<b>DURATION: 3 HOURS</b>	<b>MARKS: 100</b>

<b>SECOND OPPORTUNITY/SUPPLEMENTARY EXAMINATION PAPER</b>	
<b>EXAMINER(S)</b>	<b>MS BELINDA ROSELIN TSAUSES</b>
<b>MODERATOR:</b>	<b>MS NDESHIPEWA HAMATWI-VALOMBOLA</b>

**INSTRUCTIONS TO CANDIDATES**

1. Answer **ALL** questions in your answer booklet.
2. This examination paper consists of **THREE** sections:
  - **Section A:** 40 marks (Multiple Choice and True/False questions)
  - **Section B:** 25 marks (Short answer questions)
  - **Section C:** 35 marks (Case studies with image interpretation)
3. Write legibly and use **black or blue ink only**. Pencil may only be used for diagrams.
4. No reference materials, textbooks, or notes are permitted.

**THIS QUESTION PAPER CONSISTS OF 12 PAGES** (including this front page).

**Section A (40 marks)**

**Question 1**

**[30]**

Evaluate the statements in each numbered section and select the most appropriate answer. Write correct **letter** next to the corresponding number.

- 1.1 The transformation zone of the cervix is: (1)
- A. Only found in nulliparous women.
  - B. The site where reserve cells undergo metaplasia.
  - C. Located entirely within the endocervical canal.
  - D. Not important for cervical screening.
- 1.2 Which hormone is primarily responsible for proliferation and maturation of vaginal epithelium? (1)
- A. Progesterone
  - B. Estrogen
  - C. FSH
  - D. LH
- 1.3 Navicular cells are characteristically seen in: (1)
- A. Atrophic smears.
  - B. Mid-cycle proliferative phase.
  - C. HPV infection.
  - D. Pregnancy/progesterone-dominant states.
- 1.4 The ideal time to take a cervical sample during the menstrual cycle is: (1)
- A. During menstruation
  - B. Days 1-5
  - C. Mid-cycle (days 10-18)
  - D. Day 28

- 1.5 Which cell type predominates in postmenopausal atrophic smears? (1)
- A. Superficial cells
  - B. Parabasal cells
  - C. Intermediate cells
  - D. Metaplastic cells
- 1.6 The Maturation Index is expressed as: (1)
- A. Superficial : Intermediate : Parabasal
  - B. Parabasal : Intermediate : Superficial
  - C. Intermediate : Superficial : Parabasal
  - D. Parabasal : Superficial : Intermediate
- 1.7 Cytolysis is caused by: (1)
- A. Lactobacilli fermenting glycogen
  - B. HPV infection
  - C. Radiation therapy
  - D. Bacterial vaginosis
- 1.8 Blue blobs in atrophic smears represent: (1)
- A. Bacterial colonies
  - B. HPV-infected cells
  - C. Degenerative parabasal cells
  - D. Fungal elements
- 1.9 The secretory phase of the menstrual cycle is dominated by: (1)
- A. Estrogen only
  - B. Progesterone
  - C. FSH
  - D. LH

- 1.10 Numerous anucleate squames and orangeophilic keratinized squamous cells with small pyknotic nuclei are present; no dysplasia. The finding is best called: (1)
- A. HSIL, keratinizing type.
  - B. Parakeratosis/hyperkeratosis (benign reactive change).
  - C. ASC-H.
  - D. Unsatisfactory due to keratin.
- 1.11 A maturation index compatible with estrogenic peak (mid-cycle) is most likely: (1)
- A. 80:20:0
  - B. 0:80:20
  - C. 20:60:20
  - D. 0:20:80
- 1.12 Endocervical cells in a cervical smear indicate: (1)
- A. Transformation zone sampling.
  - B. Endometrial pathology.
  - C. HPV infection.
  - D. Invasive cancer.
- 1.13 Endocervical cells classically show: (1)
- A. Top-hat clusters.
  - B. Honeycomb sheets/palisades.
  - C. Single dispersed cells.
  - D. Nuclear grooves.
- 1.14 Blue blobs are most associated with: (1)
- A. Severe atrophy.
  - B. Candida infection.
  - C. Trichomonas.
  - D. Normal mid-cycle smears.

- 1.15 The hallmark nuclear feature of superficial squamous cells is: (1)
- A. Large vesicular nucleus.
  - B. Small pyknotic nucleus (~5  $\mu\text{m}$ ).
  - C. Hyperchromatic nucleus.
  - D. Multiple nucleoli.
- 1.16 Reserve cell hyperplasia is the precursor for: (1)
- A. Glandular lesions only.
  - B. Squamous lesions only.
  - C. Both squamous and adenocarcinoma.
  - D. Normal metaplasia only.
- 1.17 The secretory phase is characterized by: (1)
- A. Superficial cell predominance
  - B. Intermediate cell predominance
  - C. Parabasal cell predominance
  - D. Anucleate squames
- 1.18 HPV vaccination targets which high-risk types primarily? (1)
- A. HPV 6 and 11
  - B. HPV 31 and 33
  - C. HPV 16 and 18
  - D. HPV 45 and 52
- 1.19 Liquid-based cytology (LBC) compared to conventional smears: (1)
- A. Has more air-drying artifacts.
  - B. Produces cleaner backgrounds.
  - C. Cannot be used for HPV testing.
  - D. Requires immediate staining.

- 1.20 Transformation Zone adequate sampling requires at least: (1)
- A. 5 superficial cells.
  - B.  $\geq 10$  endocervical or metaplastic cells.
  - C. 50 parabasal cells.
  - D. Navicular cells present.
- 1.21 On a conventional Pap smear, several squamous cells show irregular, refractile, "cornflake-like" cytoplasmic edges with overall pale, washed-out cytoplasm. The background also appears slightly granular, and fixation was reported to be delayed. What is the best interpretation? (1)
- A. Koilocytosis due to HPV effect.
  - B. Glycogenated intermediate cells.
  - C. Air-drying artifact ("cornflake" artifact) from delayed fixation.
  - D. Degenerative changes in atrophic vaginitis.
- 1.22 Which finding most strongly supports an "adequate" Pap test under the Bethesda System? (1)
- A.  $\geq 5,000$  squamous cells on a conventional smear.
  - B. Presence of endocervical/transformation zone component.
  - C. Completely blood-stained background.
  - D. Predominance of parabasal cells only.
- 1.23 The correct fixation procedure for conventional cervical smears is: (1)
- A. Air-dry for 10 minutes first.
  - B. Fix immediately in 95% ethanol while wet.
  - C. Allow partial drying.
  - D. Fix after staining.

- 1.24 A Pap test shows cells with markedly increased N:C ratio, coarse/clumped chromatin, irregular nuclear contours, and scant cyanophilic cytoplasm. Which diagnosis is most consistent? (1)
- A. Reactive/reparative changes.
  - B. LSIL (CIN 1).
  - C. HSIL (CIN 2–3).
  - D. Atrophy with inflammation.
- 1.25 NILM smear with many navicular cells is most consistent with: (1)
- A. Atrophy
  - B. HSIL
  - C. Early pregnancy/luteal phase
  - D. Menstruation
- 1.26 Actinomyces-like organisms are classically associated with: (1)
- A. IUCD (IUD) use
  - B. Menopause
  - C. HSV infection
  - D. Diabetes
- 1.27 Why is the menstrual cycle phase important in cytology interpretation? (1)
- A. It determines malignancy likelihood.
  - B. Hormones influence cell maturation types.
  - C. It only affects staining.
  - D. Cytology requires menstruation.
- 1.28 Degenerative changes in cytology include: (1)
- A. Koilocytosis
  - B. Karyorrhexis, karyolysis, cytoplasmic changes
  - C. Active hormonal stimulation
  - D. Viral proliferation

- 1.29 An asymptomatic 48-year-old has exfoliated endometrial cells reported on Pap test. What is the best next step? (1)
- A. No action; always a benign finding
  - B. Treat empirically for endometritis
  - C. Clinical evaluation for possible endometrial pathology
  - D. Repeat Pap in 3 years.
- 1.30 Filamentous, radiating bacterial colonies ("cotton-ball" or sunburst) are seen on a Pap smear from a patient with an intrauterine device (IUD). The most likely organism is: (1)
- A. *Trichomonas vaginalis*
  - B. Actinomyces-like organisms
  - C. *Candida* species
  - D. *Chlamydia trachomatis*

**Question 2**

**[10]**

Indicate whether each statement is TRUE or FALSE. Write only "True" or "False" next to the question number.

- 2.1 Superficial cells have large pyknotic nuclei approximately 5  $\mu\text{m}$  in size. (1)
- 2.2 Progesterone promotes complete maturation to superficial cells. (1)
- 2.3 Metastasis is the spread of cancer cells from the primary tumor site to distant organs or tissues through the bloodstream or lymphatic system. (1)
- 2.4 Invasion refers to the penetration of malignant cells through the basement membrane into underlying stromal tissue. (1)
- 2.5 Endocervical cells indicate sampling of the transformation zone. (1)
- 2.6 Menstruation is the ideal time for cervical screening. (1)
- 2.7 Navicular cells are boat-shaped glycogenated intermediate cells. (1)
- 2.8 Atrophic smears show predominantly superficial cells. (1)
- 2.9 The lactating pattern shows parabasal cell predominance. (1)
- 2.10 HPV vaccination eliminates the need for cervical screening. (1)

### Section B (25 marks)

**Question 3** [12]

- 3.1 Identify the FOUR normal squamous epithelial cell types in the correct order of progression from the least mature to the most mature. (4)
- 3.2 Explain how the identified squamous epithelial cells in question 3.1 proliferate and differentiate to form each subsequent cell layer, describing ONE key nuclear and cytoplasmic changes that occur during these maturation processes at cellular level. Present all your answers in a table. (8)

**Question 4** [13]

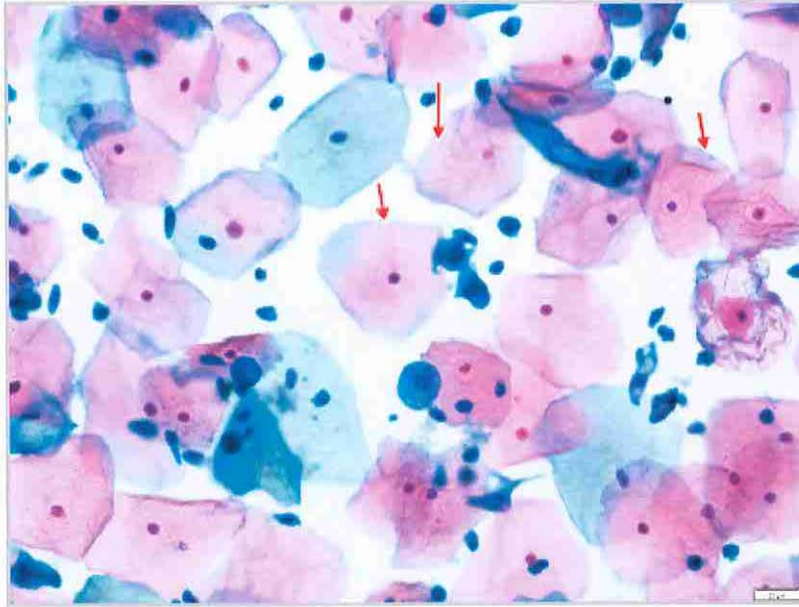
- 4.1 State which cells lactobacilli act upon during cytolysis and explain how. (5)
- 4.2 Briefly explain FOUR key quality control steps for conventional smears and fixation to minimize artefacts. (4)
- 4.3 Differentiate between cytology and histology as diagnostic methods, and explain when cytology is the preferred choice. (4)

### Section C (35 marks)

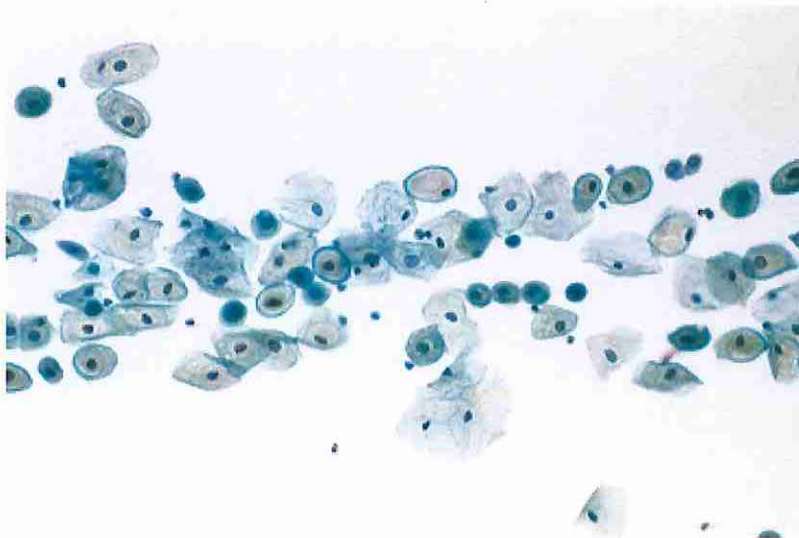
**Question 5** [15]

Study the three cytologic images provided below representing different menopausal phases. For EACH slide (labelled A-C), provide the following information in one table:

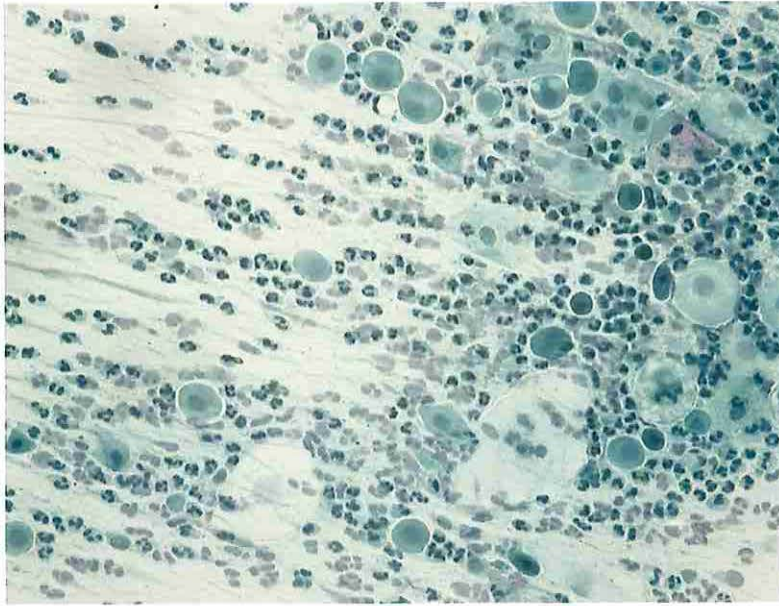
- 5.1 Phase identification (3)
- 5.2 Two cytologic features (6)
- 5.3 Maturation Index (MI) (3)
- 5.4 Clinical significance (3)



Slide A



Slide B

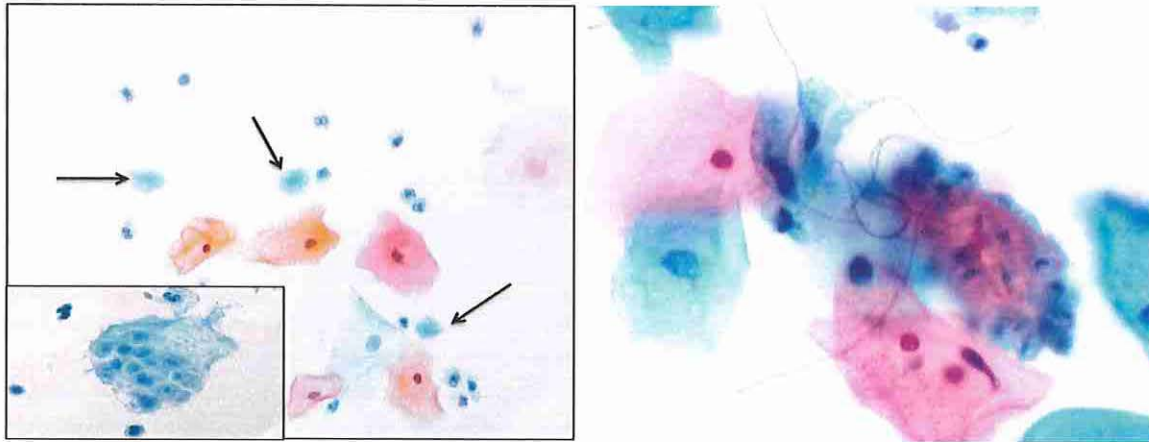


Slide C

**Question 6**

**[20]**

A 28-year-old woman presents with vaginal discharge and itching. Study the cytologic images of her cervical smear provided below:



- 6.1 Provide the diagnosis. (1)
- 6.2 Describe FOUR hallmark cytologic features of the identified organism. (4)
- 6.3 Describe the background/ancillary findings. (3)
- 6.4 State the typical vaginal pH and clinical symptoms. (2)
- 6.5 Outline the treatment and management recommendations. (4)
- 6.6 Identify the type of smear preparation and staining technique used for these cervical images. Substantiate your answers by describing TWO characteristic features visible in each. (6)

**Good luck!**