



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF CLINICAL HEALTH SCIENCES

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

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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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:** 30 marks (Short answer questions)
 - **Section C:** 30 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 A 42-year-old woman presents with a cervical smear showing atypical glandular cells. The cells are arranged in three-dimensional clusters with nuclear crowding, occasional rosette formation, and feathering at the periphery. Nuclear enlargement is 3× normal with irregular chromatin. Which Bethesda System category is MOST appropriate? (1)
- A. NILM with reactive endocervical cells.
 - B. Atypical Glandular Cells (AGC) - favor neoplastic.
 - C. Endocervical Adenocarcinoma in situ (AIS).
 - D. Atypical Glandular Cells - Not Otherwise Specified (AGC-NOS).
- 1.2 The hallmark nuclear feature of superficial squamous cells is: (1)
- A. Vesicular ~8 µm
 - B. Pyknotic ~5 µm
 - C. Irregular hyperchromatic
 - D. Macronucleolus
- 1.3 A cervical smear from a 28-year-old asymptomatic woman shows numerous mature squamous cells with perinuclear halos and slightly enlarged nuclei with smooth membranes. However, the cytoplasm is glycogen-rich without peripheral condensation, and nuclei show uniform fine chromatin. Colposcopy shows no acetowhite changes. What is the MOST likely interpretation? (1)
- A. LSIL (Low-grade squamous intraepithelial lesion).
 - B. ASC-US (Atypical squamous cells of undetermined significance).
 - C. NILM - glycogenated intermediate cells mimicking koilocytes.
 - D. ASC-H (Atypical squamous cells - cannot exclude HSIL) .

- 1.4 A lactational/gestational pattern is characterized by predominance of: (1)
- A. Superficial cells
 - B. Parabasal cells
 - C. Navicular (glycogenated intermediate) cells
 - D. Anucleate squames
- 1.5 *Trichomonas vaginalis* on Pap smear is best recognized by: (1)
- A. Flagella always visible
 - B. Pear-shaped body, eccentric nucleus, cytoplasmic granules
 - C. Pseudohyphae
 - D. Viral inclusions
- 1.6 Cervical smear shows numerous squamous cells with obscured cellular detail and a background of mixed bacterial flora including curved rods, cocci, and absence of lactobacilli. Many squamous cells have adherent coccobacilli completely coating the cell membrane, giving a granular "ground glass" appearance. Which additional finding would MOST strongly support the diagnosis? (1)
- A. Perinuclear halo formation.
 - B. Loss of sharp cytoplasmic borders and "smudged" cell edges.
 - C. Intracytoplasmic vacuoles with organisms.
 - D. Nuclear enlargement with hyperchromasia.
- 1.7 A key clue for typical repair is: (1)
- A. Loss of polarity
 - B. Streaming nuclear polarity in flat monolayer sheets
 - C. Marked hyperchromasia
 - D. Enucleation

- 1.8 The nucleus of an intermediate cell is approximately the size of a: (1)
A. Parabasal nucleus
B. Superficial nucleus
C. Endometrial cell nucleus
D. HSIL nucleus
- 1.9 Cytolysis is primarily due to: (1)
A. HSV
B. Lactobacilli acting on glycogenated cells.
C. Radiation
D. Atrophy alone
- 1.10 ASC-H implies: (1)
A. Cannot exclude HSIL
B. Definite HSIL
C. NILM with HPV CPE
D. LSIL only
- 1.11 A maturation index compatible with estrogenic peak (mid-cycle) is most likely: (1)
A. 80:20:0
B. 0:80:20
C. 0:20:80
D. 60:40:0
- 1.12 Dyskeratosis commonly accompanies: (1)
A. Flat condyloma
B. Typical repair
C. NILM postpartum
D. Endometrial shedding

- 1.13 Endocervical cells classically show: (1)
- A. Top-hat clusters
 - B. Honeycomb sheets/palisades
 - C. Cobblestone
 - D. Pearls
- 1.14 Blue blobs are most associated with: (1)
- A. Severe atrophy
 - B. Candida
 - C. Trichomonas
 - D. Actinomyces
- 1.15 CIN grading correlates cytologically most with: (1)
- A. Cytoplasmic hue alone
 - B. Progressive nuclear atypia & N/C ratio
 - C. Goblet cells
 - D. Barr bodies
- 1.16 Reserve cell hyperplasia is the precursor for: (1)
- A. Glandular only
 - B. Squamous only
 - C. Squamous, adeno- and adenosquamous lesions
 - D. None
- 1.17 Which of the following best describes metaplastic cells in cervical cytology? (1)
- A. Cells that arise from the transformation of columnar epithelium to squamous epithelium, usually appearing as small polygonal cells with dense cytoplasm and distinct borders.
 - B. Cells derived from the endometrium during menstruation.
 - C. Koilocytotic cells with perinuclear clearing and nuclear atypia.
 - D. Cells showing malignant features with coarse chromatin and irregular membranes.

- 1.18 "Two-toned" polychromasia and kite cells are minor features sometimes seen with: (1)
- A. Candida
 - B. BV
 - C. HPV infection
 - D. Actinomyces
- 1.19 What does the term "atypical squamous epithelial cell" mean in cervical cytology? (1)
- A. Cells that are definitely malignant.
 - B. Squamous cells that show changes beyond reactive alterations but are insufficient for a definitive intraepithelial lesion diagnosis.
 - C. Cells that are infected with HPV.
 - D. Normal squamous cells seen in the transformation zone.
- 1.20 Transformation Zone adequate sampling when smear contains at least: (1)
- A. 5 superficial
 - B. ≥ 10 well-preserved endocervical or metaplastic cells.
 - C. 50 parabasal
 - D. Navicular cells
- 1.21 Parakeratosis is defined cytologically by: (1)
- A. Anucleate squames
 - B. Miniature superficial-like cells with pyknotic nuclei.
 - C. Balloon cells
 - D. Cornflake artifact

- 1.22 In atrophic smears, a pitfall is confusion of parabasal clusters with: (1)
- A. Endometrial cells
 - B. Endocervical cells
 - C. HSIL
 - D. Candida
- 1.23 Which of the following best describes the correct fixation procedure for conventional cervical cytology smears? (1)
- A. Air-dry the smear for 10 minutes before applying fixative.
 - B. Fix the smear immediately in 95% ethanol or spray fixative while still wet to preserve cellular detail.
 - C. Allow the smear to dry partially before immersion in alcohol.
 - D. Fix the smear after staining to improve cytoplasmic clarity.
- 1.24 The cellular index widely used in hormonal cytology is: (1)
- A. KPI
 - B. Eosinophilic index
 - C. Maturation Index
 - D. Crowding index
- 1.25 NILM smear with many navicular cells is most consistent with: (1)
- A. Early pregnancy/luteal
 - B. HSIL
 - C. Acute cervicitis only
 - D. Atrophy
- 1.26 Actinomyces-like organisms are classically associated with: (1)
- A. IUCD use
 - B. Menopause
 - C. HSV
 - D. Candida

- 1.27 Why is it important to consider the phase of the menstrual cycle when interpreting cervical cytology? (1)
- A. Because the menstrual cycle determines the likelihood of malignancy.
 - B. Because hormonal variations during the cycle influence the type and maturation of exfoliated epithelial cells seen on cytology.
 - C. Because the menstrual cycle affects the staining properties of the cells only.
 - D. Because cytology can only be performed during menstruation.
- 1.28 Which of the following best describes degenerative changes in gynaecological cytology? (1)
- A. Cytoplasmic keratinization with associated koilocytosis.
 - B. Features associated with active hormonal stimulation of squamous cells.
 - C. Cellular alterations such as karyorrhexis, karyolysis, and cytoplasmic changes (e.g., pseudo-eosinophilia, hyalinization) due to cell breakdown.
 - D. Proliferative changes in response to viral infection.
- 1.29 A 52-year-old perimenopausal woman has irregular cycles. Her day 21 progesterone level is low. A cervical smear shows a maturation index of 10:85:5 (parabasal:intermediate:superficial). Which hormonal pattern is MOST consistent with these findings? (1)
- A. Adequate luteal phase with normal progesterone effect.
 - B. Hyperestrogenic state with LH surge.
 - C. Anovulatory cycle with insufficient progesterone.
 - D. Normal ovulatory cycle at mid-luteal phase.
- 1.30 "Clue cells + diffuse coccobacilli, absent lactobacilli" supports: (1)
- A. Normal flora
 - B. Bacterial vaginosis
 - C. Candidiasis
 - D. Trichomoniasis

Question 2

[10]

Evaluate the statements in each numbered section and select the most appropriate answer. Write "True" or "False" next to the corresponding number.

- 2.1 The nucleus of a superficial cell is ~8 µm and vesicular. (1)
- 2.2 Inflammation typically causes nuclear enlargement <2× the ICN with smooth membranes. (1)
- 2.3 Cell growth and cell division should always occur together. (1)
- 2.4 Parabasal cell predominance is compatible with atrophic smears. (1)
- 2.5 The principle of the cytopsin is to separate cells based on their density using centrifugal buoyancy, similar to differential centrifugation. (1)
- 2.6 "Blue blobs" are degenerative parabasal material commonly seen in severe atrophy. (1)
- 2.7 Reserve cell hyperplasia originates from endometrial stroma. (1)
- 2.8 Typical repair shows streaming polarity in monolayer sheets. (1)
- 2.9 Actinomyces-like organisms are obligate pathogens and always require treatment. (1)
- 2.10 ASC-H means atypical squamous cells where HSIL cannot be excluded. (1)

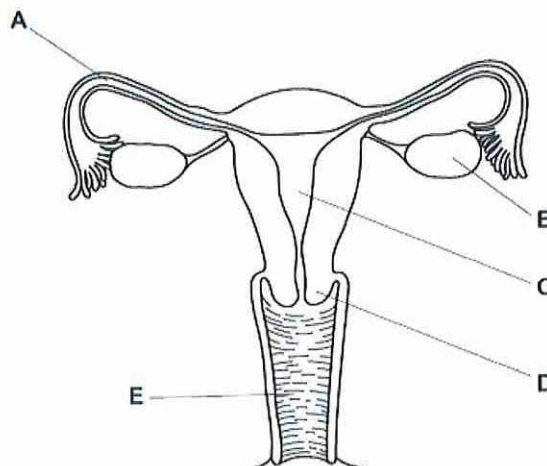
Section B (30 marks)

Question 3

[19]

Study the labelled diagram of the female reproductive system and:

- 3.1 Identify and name parts A–E and describe the epithelial lining of each. (10)



- 3.2 Demonstrate your understanding of the distinct anatomical regions of the cervix and its cytological significance in the diagnosis of cervical cancer based on the following criteria:
- 3.2.1 Ectocervix (2)
 - 3.2.2 Endocervical Canal/Endocervix (2)
 - 3.2.3 Squamocolumnar Junction (2)
 - 3.2.4 Transformation Zone (2)
- 3.3 Why do you think that the integrated knowledge under question 2 is important in cervical cancer diagnosis? (1)

Question 4 [11]

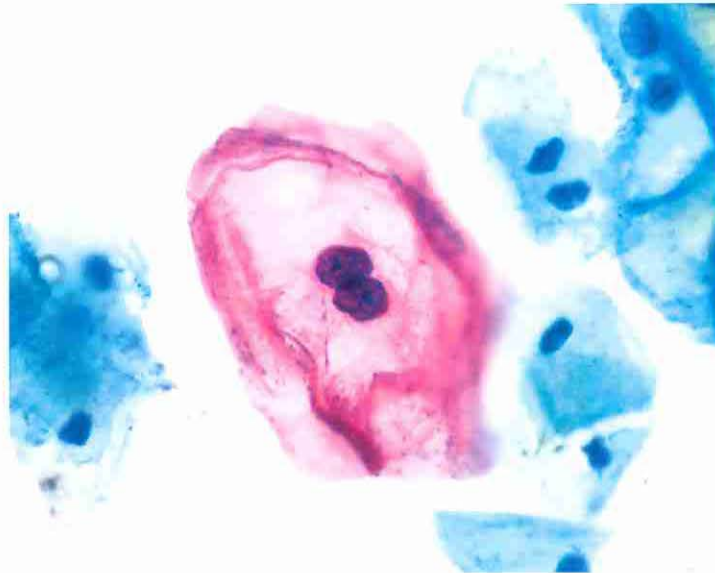
- 4.1 Both endocervical and endometrial cells are glandular epithelial cells of the female genital tract. Distinguish between endocervical and endometrial cells by tabulating their cytologic differences based on the following criteria: nuclei, cytoplasm, arrangement, and clinical correlation. (8)
- 4.2 Differentiate between liquid-based cytology (LBC) and conventional Smears in cervical cytology by giving three key differences. Copy and complete the table in your answer book. (3)

Section C (30 marks)

Question 5

[20]

You are presented with a cervical smear from a 29-year-old woman attending routine screening. The patient is asymptomatic, and this is her first abnormal smear. The digital cytology slide (COLOUR COPY) below is provided for evaluation:

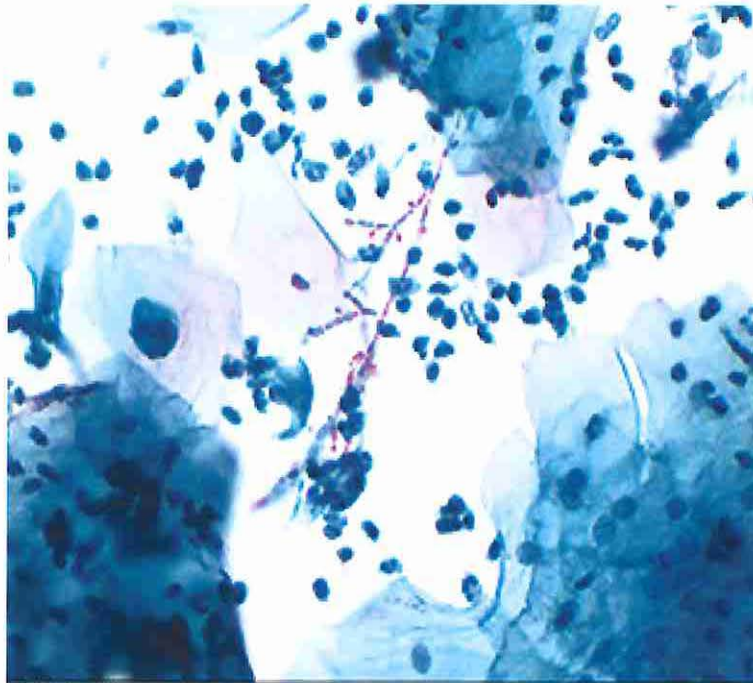


- 5.1 Identify the abnormal cell type(s) present on the slide and describe TWO cytoplasmic and TWO nuclear features evident. (6)
- 5.2 Classify the CIN grade represented in this smear and justify your classification. Your justification must refer to epithelial involvement and cytological features. (4)
- 5.3 Briefly outline the pathogenesis of HPV infection leading to cervical intraepithelial neoplasia (CIN), indicating the latent and productive phases. (6)
- 5.4 Indicate the clinical follow-up / management typically recommended for this lesion in a screening context, according to standard guidelines. (4)

Question 6

[10]

You are presented with a cervical smear from a 31-year-old woman complaining of increased vaginal discharge with mild vulvar itching. Study the digital cytology slide (COLOUR COPY) provided below:



- 6.1 Identify the infectious organism present and describe TWO characteristic cytological features that confirm your diagnosis. (3)
- 6.2 What is the typical pH range associated with this infection, and how does this differ from bacterial vaginosis? (2)
- 6.3 State FIVE predisposing factors for this infection that should be considered during patient management. (5)

Good luck!