Exam Date & Time: 02-Sep-2025 (09:30 AM - 12:30 PM)

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

MBBS Phase I Degree Examination
September 2025 QP CODE: A001

Anatomy Paper 1 [ANA1]

Marks: 100 **Duration: 180 mins.**

MCQ 20 X 1 = 20

Answer all the questions. Section Duration: 30 mins

1 Corpus luteum of pregnancy persist for (1)

1)	1 to 2 months	2)	3 to 4 months	3)	4 to 5 months	4)	5 to 6 months

2 Middle radioulnar joint is an example for (1)

1)	Synchondrosis	2)	Syndesmosis	3)	Synovial plane	4)	Synovial saddle

3 Melanocytes are seen in which layer of skin? (1)

1)	Stratum lucidum	2)	Stratum corneum	3)	Stratum granulosum	4)	Stratum basale

4 A 55-year-old female complained to her family physician of hard painless lump in the upper and outer portion of her right breast. The examination of the breast revealed the peau d'orange appearance of the skin, loss of mobility of the breast and retraction of the nipple. She was diagnosed as a case of breast cancer. Peau d'orange appearance of the skin is because of (1)

1)	Cancer cells infiltrating suspensory ligament	2)	Cancer cells infiltrating lactiferous ducts	3)	Cancer cells infiltrating lactiferous sinus	4)	Cancer cells obstructing the superficial lymph vessels

5 All of the following are examples of white fibrocartilage **EXCEPT** (1)

1)	Intervertebral discs	2)	Articular cartilage of TMJ	3)	Cartilage of pinna of the ear	4)	Acetabular labrum

6 A 60-year-old woman presents to the emergency department with sudden onset weakness on the right side of her body and slurred speech. Imaging studies reveal a stroke affecting the internal capsule. Which part of the internal capsule is **most** likely affected in this case? (1)

1)	Anterior limb	2)	Posterior limb	3)	Genu	4)	Retrolentiform

7 A 49-year old woman comes to clinic with chief complaint of feeling poorly, fatigue, cold intolerance, weight gain, constipation and puffiness of her face. Her thyroid gland appears firm and enlarged. Her laboratory tests indicate elevated TSH. T4 and T3 levels were normal . What is the **most** likely diagnosis? (1)

1)	Euthyroidism	2)	Grave's disease	3)	Hyperthyroidism	4)	Hypothyroidism

8 The anterior intercostal arteries in the 7 to 9 intercostal spaces arise from the (1)

1)	Internal thoracic artery	2)	Pericardiophrenic artery	3)	Musculophrenic artery	4)	Superior epigastric artery

9 A 7-year-old boy was taken by his parents to the physician and complained that their son was suffering from recurrent attacks of sore throat. He had difficulty in swallowing and feeling pain in his throat and ears. The boy was diagnosed as a case of tonsillitis by the physician. The following structures form a part of tonsillar bed **EXCEPT** (1)

1)	Pharyngobasilar fascia		2)	Superior Constrictor muscle		3)	Middle constrictor muscle		4)	Buccopharyngeal fascia	

10 Smooth part of the right atrium consist all of the following **EXCEPT**

1)	Superior vena cava opening		2)	Inferior venacaval opening		3)	Opening of coronary sinus		4)	Crista terminalis	

(1)

11 A 78-year-old male patient complained of fatigue, dizziness and chest pain during exercise. Clinical examination revealed an irregular heartbeat and swelling in the feet. Testing showed atrial fibrillation (AF). He was diagnosed as defect in conducting system of heart. Where is the pacemaker of heart located?

(1)

1)	Moderator band		2)	Triangle of Koch		3)	Apex of heart		4)	Atriocaval junction of upper part of sulcus terminalis	

12 Posterior border of falx cerebelli contains which of the following sinus?

(1)

1)	Sigmoid		2)	Occipital		3)	Straight		4)	Transverse	

13 External acoustic meatus is developed from

1)	1st ectodermal cleft		2)	2nd ectodermal cleft		3)	3rd ectodermal cleft		4)	4th ectodermal cleft	

(1)

14 Which of the following nerve supplies the Intrinsic muscles of the tongue?

(1)

1)	Lingual		2)	Hypoglossal		3)	Glossopharyngeal		4)	Occulomotor	

15 Cellular reticulum is seen in

(1)

1)	Spleen		2)	Thymus		3)	Tonsil		4)	Lymph node	

16 Which of the following nerves delimits pons from middle cerebellar peduncle?

(1)

1)	Oculomotor		2)	Trochlear		3)	Trigeminal		4)	Facial	

17 Smallest duct of salivary gland is

(1)

1)	Striated		2)	Intercalated		3)	Interlobular		4)	Intralobular	

18 Biceps brachii is a powerful

(1)

1)	Supinator		2)	Pronator		3)	Extensor		4)	Flexor	

19 The side of the blastocyst to which inner cell mass is attached is called as

(1)

1)	Embryonic pole		2)	Abembryonic pole		3)	Prochordal plate		4)	Primitive streak	

20 The paralysis of deltoid muscle causes loss of abduction at the shoulder joint from

1)	Zero to 15 degrees		2)	15 to 90 degrees		3)	Zero to 90 degrees		4)	90 to 180 degrees	

(1)

Long Essay Questions: 10 X 1 = 10

Answer all the questions.

21 A 40-year-old woman comes to the clinic with a painful swelling just below and in front of her right ear. On examination, the swelling is firm and tender and she has weakness of facial muscles on the same side, suggesting involvement of the facial nerve. Describe the gland involved in this case under the following headings:

a) Capsules

b) External features

c) Structures passing through it. (2 + 5 + 3)

(10)

Short Essay Questions 11 X 5 = 55

Answer all the questions.

22			Explain the blood supply and lymphatic drainage of breast.	(5)
23			Describe the external features and arterial supply of spinal cord.	(5)
24			Explain development of tongue and its congenital anomalies.	(5)
25			A 55-year-old man is brought to the emergency department after sustaining a stab injury to the upper part of his neck, just anterior to the sternocleidomastoid. He was bleeding profusely and the surgeon was worried about the damage to major vessels and nerves. Describe the boundaries and contents of Carotid triangle?	(5)
26			Describe the parts, extent, relations and functions of auditory tube.	(5)
27			Describe the course and tributaries of Azygous vein.	(5)
28			A man presented to the hospital with the history of weakness and later loss of extension of elbow and wrist. He was using crutches for mobility after an injury in left lower limb. The patient was diagnosed as a case of 'Crutch paralysis'. a) Which nerve is injured in this case? b) Mention the root value of the nerve involved. c) Name the branches and distribution of the nerve involved. (1+1+3)	(5)
29			Explain the microscopic structure of spleen.	(5)
30			A 55-year-old patient presented with severe headache. After sometime he became unconscious and later developed left-sided hemiplegia and hemianesthesia. The patient had history of hypertension for the past 15 years. a) What is the probable diagnosis? b) Name the artery involved in above case. c) Write a note on blood supply of cerebrum. (1+1+3)	(5)
31			A 44 year old man presented to TB clinic with symptoms of progressive shortness of breath and cough with greenish sputum production. His sputum test result showed that he had a tuberculosis infection and he was started with anti-tuberculosis tablets. a) Name bronchopulmonary segments of right lung. b) Discuss the arrangement of structure in root of right and left lung. (2+3)	(5)
32			During a busy OPD, a patient interrupts repeatedly with unrelated complaints. What communication strategies can the doctor use to manage the situation effectively without dismissing the patient's concerns?	(5)

Short Answer Questions 3 X 5 = 15

Answer all the questions.

33			Mention the fate of fossa ovalis in fetus.	(3)
34			Draw a neat labelled diagram of microscopic structure of Cerebellum.	(3)
35			What is Epistaxis? Name the arteries involved in epistaxis.	(3)
36			Mention the boundaries of anatomical snuff box. Why is it called so?	(3)
37			Discuss the applied anatomy of pleura.	(3)

-----End-----

Exam Date & Time: 03-Sep-2025 (09:30 AM - 12:30 PM)

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

MBBS Phase - I Degree Examination
September 2025 QP CODE: A002

Anatomy Paper 2 [ANA2]

Marks: 100 **Duration: 180 mins.**

MCQ 20 X 1 = 20

Answer all the questions. Section Duration: 30 mins

1 All the following constitute guy ropes **EXCEPT** (1)

1)	Gracilis	2)	Semitendinosus	3)	Sartorius	4)	Semimembranosus

2 The straight vessels which are the branches of the splenic arteriole in the red pulp of spleen are called as (1)

1)	Vasa vasorum	2)	Vasa recti	3)	Penicilli	4)	Ellipsoids

3 Which ligament of stomach is called as abdominal police guard? (1)

1)	Lesser Omentum	2)	Greater Omentum	3)	Gastro-splenic	4)	Gastrophrenic

4 Auerbach's plexus is seen in which of the following layer of gastrointestinal tract? (1)

1)	Mucosa	2)	Submucosa	3)	Serosa	4)	Muscularis Externa

5 The karyotype 47XXY is seen in (1)

1)	Down's syndrome	2)	Polysomy X	3)	Klinefelter's syndrome	4)	Edward's syndrome

6 A young male sustains a straddle injury on a bicycle crossbar and develops perineal swelling.The urine is **most** likely to accumulate in which space? (1)

1)	Ischioanal fossa	2)	Deep perineal pouch	3)	Superficial perineal pouch	4)	Retropubic space

7 The **most** dependent area of the peritoneal cavity in supine position is (1)

1)	Hepato renal pouch of Morrison	2)	Recto-vesical pouch	3)	Recto-uterine pouch of Douglas	4)	Utero-vesical pouch

8 Juxtaglomerular cells are the modified smooth muscle cells in tunica media of (1)

1)	Afferent arteriole	2)	Glomerulus	3)	Efferent arteriole	4)	Loop of Henle

9 The outer **most** covering of testis is tunica (1)

1)	Vaginalis	2)	Albugenia	3)	Vasculosa	4)	Adventitia

10 Saphenous opening is an oval opening in the (1)

1)	Superficial fatty layer	2)	Deep membranous layer	3)	Deep fascia of the thigh	4)	Iliotibial tract

11 A newborn is diagnosed with an imperforate anus. This is due to the failure in the development of which of the following structure? (1)

1)	Hindgut	2)	Cloacal membrane	3)	Urogenital sinus	4)	Allantois

12 Ureteric bud develops from (1)

1)	Pronephros	2)	Mesonephros	3)	Metanephros	4)	Mesonephric duct

13 A 50-year-old woman presents to the clinic with difficulty lifting the front part of her right foot causing her to trip frequently. She also reports numbness on the dorsum of her foot and shin. On examination, there was weakness in dorsiflexion of the right foot. Which nerve injury is **most** likely responsible for the patient's foot drop? (1)

1)	Tibial nerve	2)	Deep peroneal nerve	3)	Saphenous nerve	4)	Sciatic nerve

14 Which zone of prostate is **more** prone for carcinoma? (1)

1)	Peripheral zone	2)	Central zone	3)	Periurethral zone	4)	Paraurethral zone

15 A child is born with an extra chromosome in each of its cells. This is usually the result of (1)

1)	Non-disjunction	2)	Crossing over	3)	Segregation	4)	Hybridization

16 A 60-year-old male presents with jaundice and weight loss. Imaging shows a mass at the head of the pancreas. Which structure is **most** likely compressed? (1)

1)	Pancreatic duct	2)	Common bile duct	3)	Hepatic artery	4)	Inferior vena cava

17 Which of the following is an example of terminal deletion of chromosomes? (1)

1)	Prader -willi syndrome	2)	Cri-du-chat syndrome	3)	Patau syndrome	4)	Angelman syndrome

18 Derivatives of hindgut are all of the following **EXCEPT** (1)

1)	Descending colon	2)	Sigmoid colon	3)	Left one third of transverse colon	4)	Proctodeum below anal membrane

19 During a hysterectomy, the surgeon must ligate the uterine artery. Which structure must be preserved? (1)

1)	Round ligament	2)	Ovarian artery	3)	Ureter	4)	Fallopian tube

20 Lymph node of Cloquet is present in (1)

1)	Femoral ring	2)	Adductor canal	3)	Popliteal fossa	4)	Sole of the foot

Long Essay Questions: 10 X 1 = 10

Answer all the questions.

21 A 70 year old patient with history of chronic bronchitis and constipation complained that he noticed a gradually increasing swelling in his right groin and often feels dragging and aching sensation at that site. On physical examination the doctor noticed a globular lump above the right pubic tubercle, which expands on coughing. After manually reducing the swelling/lump, occluded the deep inguinal ring with his thumb and asked the patient to cough. The swelling reappeared medial to the thumb. A diagnosis of direct inguinal hernia was made. (10)
a) Describe the boundaries and contents of inguinal canal?
b) What is inguinal hernia?
c) What are the types of inguinal hernias and how they differ from each other?
d) How to differentiate Inguinal hernia from femoral hernia clinically (5+1+3+1)

Short Essay Questions: 11 X 5 = 55

Answer all the questions.

22 Describe the microscopic structure of Kidney. (5)

23 Describe the development of pancreas and its congenital anomalies (5)

24			Describe the origin, insertion, nerve supply and action of hamstring muscles.	(5)
25			Mention the principles and importance of good communication skills in healthcare delivery	(5)
26			A 38 year old female visited the doctor with complaint of lower abdominal pain and foul smelling discharge from vagina for last 7 days. Physical examination revealed tenderness in lower abdomen. CT scan examination revealed salpingitis affecting both the uterine tubes with tubal blockage. a) What are the parts of uterine tube? b) What is the blood supply of fallopian tube? c) What is hysterosalpingography? (1+2+2)	(5)
27			Describe the boundaries of lesser sac and its recesses.	(5)
28			A 55-year-old man frequently complains of headaches and occasional dizziness. These symptoms are attributed to work stress. During a routine check-up, his blood pressure was consistently elevated (e.g., 150/95 mmHg) on multiple readings over several weeks. He has a family history of heart disease. He is provisionally diagnosed with hypertension. a) Which type of blood vessel is responsible for regulating blood flow to capillaries and significantly contributes to peripheral resistance? b) Name the **three** layers of an artery? c) Name the large elastic artery that exits the left ventricle and distributes blood to the systemic circulation. d) Which type of blood vessel contains valves to prevent backflow of blood, especially in the limbs? (1+2+1+1)	(5)
29			A football player with a history of injury to the right knee joint, complained of sharp pain in the medial aspect of the right knee. He told the doctor that he received a blow on the lateral side of the knee. The doctor examined his right knee carefully. The radiograph of the knee was completely normal, but an MRI study of the knee revealed an injury to the medial meniscus of the knee joint. a) Name the ligaments of the knee joint. b) Name the structures which maintain the stability of the joint. c) Name the structures attached to the intercondylar area of the tibia. (2+1+2)	(5)
30			Describe the boundaries and contents of deep perineal pouch.	(5)
31			A 15 year old girl was diagnosed with Turner's syndrome after detailed history taking, physical examination and investigations done by the physician in the hospital. a) What is the genotype in this case? b) State the causes of Turner's syndrome. c) List the clinical features of Turner's syndrome. (1+2+2)	(5)
32			A 45-year-old male patient presented with a history of abdominal pain, nausea and vomiting since 7 days. Initial examination showed abdominal distention with shifting dullness. Describe the formation and sites of Portocaval anastomosis	(5)

Short Answer Questions: 3 X 5 = 15

Answer all the questions.

33			Explain the applied aspects of Meckel's diverticulum.	(3)
34			Mention the causes and features of Hirschsprung's disease	(3)
35			Draw a neat labelled diagram of the microscopic structure of Fundic part of stomach.	(3)
36			Explain the importance of clinical angle of spleen.	(3)
37			Explain the anatomical basis of the Trendelenburg sign.	(3)

-----End-----

Exam Date & Time: 08-Sep-2025 (09:30 AM - 12:30 PM)

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

MBBS Phase - I Degree Examination
September 2025 QP CODE: A005

BiochemistryPaper 1 [BIO1]

Marks: 100 **Duration: 180 mins.**

MCQ: 20 X 1 = 20

Answer all the questions. Section Duration: 30 mins

1 Glucose -6-Phosphatase is a maker enzyme for following cell organelle (1)

1)	Microsome		2)	Endoplasmic reticulum		3)	Lysosome		4)	Peroxisome	

2 Enzymes which catalyse binding of two substrates by covalent bonds are known as (1)

1)	Lyases		2)	Hydrolases		3)	Ligases		4)	Oxidoreductases	

3 A child was brought with delayed developmental mile stones, hypoglycemia, congenital cataract and jaundice. On examination hepatosplenomegaly was noted. What is the probable diagnosis? (1)

1)	Galactosemia		2)	Von Gierke's Disease		3)	Pompe's Disease		4)	Cori's Disease	

4 Which of the following lipids is deficient in infants with respiratory distress syndrome? (1)

1)	Sphingomyelin		2)	Cardiolipins		3)	Leukotrienes		4)	Dipalmitoyl phosphatidyl choline	

5 Basal Metabolic Rate (BMR) is decreased in which of the following condition? (1)

1)	Fever		2)	Pregnancy		3)	Starvation		4)	Hyperthyroidism	

6 A 38-year old male is brought to emergency department in unconscious state, history of illicit liquor consumption was given by his brother. First year resident suggested treatment with ethanol. Which of the following statements provides the **best** rationale for this treatment? (1)

1)	Ethanol acts as a non-competitive inhibitor		2)	Ethanol acts as competitive inhibitor		3)	Ethanol acts as suicide inhibitor		4)	Ethanol acts as allosteric repressor	

7 A 40 year old male comes for advise on balanced diet. His question was in what ratio should saturated fatty acid, monounsaturated fatty acid and polyunsaturated fatty acid should be present in fat proximate principal of his diet. (1)

1)	1 : 2: 3		2)	1 : 3 : 2		3)	1 : 1: 1		4)	2 : 1 : 3	

8 A 3 year old child is brought to the paediatric OPD with lethargy, swollen belly, loss of appetite. Serum total protein and albumin was found to be decreased. Which of the following has led to this condition in the child? (1)

1)	Consuming a calorie-deficient diet that is also deficient in protein		2)	Consuming a calorie-adequate diet that is deficient in carbohydrates		3)	Consuming a calorie-adequate diet that is deficient in fatty acids		4)	Consuming a calorie-adequate diet that is deficient in proteins	

9 Alkaline phosphatase level in serum is **NOT** elevated in which the following condition (1)

1)	Obstructive jaundice		2)	Rickets		3)	Infective hepatitis		4)	Myocardial infarction	

10 Refsum's disease occurs due to deficiency of the enzyme required for the following type of oxidation of fatty acids (1)

1)	Mitochondrial beta oxidation		2)	Peroxisomal beta oxidation		3)	Alpha oxidation		4)	Omega oxidation	

11 The deficiency of which of the following vitamin affects the Transketolase activity? (1)

1)	Biotin		2)	Pyridoxine		3)	Folate		4)	Thiamine	

12 Which of the following is an example of primary active transport? (1)

1)	Cl- HCO3 exchange		2)	Na - H exchange		3)	Na - Ca2 exchange		4)	Na-K ATPase	

13 The amino acids present in pulses can supplement the limiting amino acids of which of the following food group? (1)

1)	Cereals		2)	Milk		3)	Fish		4)	Nuts and beans	

14 The uncouplers do **NOT** allow (1)

1)	Oxidation of NADH		2)	Oxidation of FADH2		3)	Reduction of oxygen to water		4)	Synthesis of ATP	

15 A 2-year-old boy is brought to the paediatric OPD with complaints of diminished vision at night. Another important manifestation of vitamin A deficiency is (1)

1)	Painful joints		2)	Bitot's spots		3)	Loss of hair		4)	Thickening of long bones	

16 Which of the following enzyme is inhibited by Fluoride in glycolysis? (1)

1)	Aldolase		2)	Enolase		3)	Hexokinase		4)	Phosphofructokinase	

17 Which of the following is an oncogene? (1)

1)	abl		2)	BRCA 1		3)	P53		4)	Rb	

18 Majority of the oxygen is utilized by the mitochondria to operate the (1)

1)	Kreb's Cycle		2)	Beta Oxidation		3)	Glycolysis		4)	Electron Transport Chain	

19 Which of the following denotes Km value? (1)

1)	Concentration of enzyme		2)	Concentration of substrate		3)	Concentration of product		4)	Concentration of inhibitor	

20 Which of the following is **NOT** true about non-competitive inhibition? (1)

1)	Inhibitor binds to the site other than active site		2)	Km value remains unchanged		3)	Vmax increases		4)	Enzyme substrate binding is not interfered	

Long Essay Questions: 10 X 1 = 10

Answer all the questions.

21 A 37-year-old boy born to consanguineous parents presented to the OPD with complaints of yellowish tuberous painless swellings on the knees, elbows and eye lids. A history of similar swellings was present in his 40-year-old brother too. The patient's father had expired at the age of 52 years due to myocardial infarction. Excision biopsy of yellowish tuberous swelling revealed xanthomas. His fasting lipid profile was as follows: Total cholesterol: 675 mg/dL, Triglyceride: 102 mg/dL, LDL-Cholesterol: 501 mg/dL, HDL-Cholesterol: 32 mg/dL (10)

a) Name the type of familial hyperlipoproteinemia and its defect in above case.

b) Discuss the biochemical basis of atherosclerosis.

c) Name and discuss the metabolism of the lipoprotein involved in transport of cholesterol from liver to the peripheral tissues. (2+3+5)

Short Essay Questions: 11 X 5 = 55

Answer all the questions.

22			A 53-year-old man met a physician with the complaints saying that he was feeling weak and getting tired more rapidly than usual. On questioning, he admitted to getting up 2-3 times at night to urinate & often felt thirsty too. He also complained of burning pain in his feet and sometimes felt his toes numb. His laboratory findings were: Fasting blood glucose 186 mg/dL, Glycated Hb 7.5% Urinalysis - glucose 1+, ketones present and proteins negative. a) What is the probable diagnosis? b) What is the reason for polyuria & polydipsia? c) Discuss the changes in carbohydrate & lipid metabolism in the given disease. (1+1+3)	(5)
23			A 12-year-old boy was brought to the hospital with complaints of excessive weight gain for 1 year. Mother informs that he hardly went outdoors to play. Dietary history revealed that he consumed lot of bakery food, pizzas, burgers and other fast food which contained lot of trans fatty acids. a) What are trans fatty acids? b) Discuss their uses and adverse effects on health. c) Enumerate examples of omega 3 fatty acids essential for health and discuss their importance. (1+2+2)	(5)
24			A boy aged 18 year came for consultation to the physician. He complained of being lethargic most of the time and had practically no physical activity. There is family history of obesity. He is 170 cms tall and weighs 100 kgs. History and examinations confirm this case is of obesity. a) Calculate body mass index for the above patient. b) Mention the World Health Organizations criteria to categorize Body Mass Index. c) Discuss the risk factors associated with obesity. (1+2+2)	(5)
25			A 54-year-old man was brought to the casualty with complaints of left sided chest pain radiating to the left arm. The cardiologist is suspecting him to be suffering with myocardial infarction (MI). Discuss the diagnostic enzymes and markers for this condition.	(5)
26			Define Oxidative Phosphorylation. Discuss the chemiosmotic coupling theory. (1+4)	(5)
27			Enumerate the types of Beri Beri. Discuss the clinical manifestations. (3+2)	(5)
28			Define and give **two** examples each for oncogenes and tumor suppressor genes. (2.5+2.5)	(5)
29			Define tumor markers. Enumerate any **two** tumor markers with the associated malignancy. (1+4)	(5)
30			Discuss glycogenolysis. Explain its hormonal regulation.	(5)
31			Define Isoenzymes. Discuss any **four** important features of isoenzymes. (1+4)	(5)
32			A male doctor while examining a female patient makes sure that a female attendant is also there during examination. Mention the role of Indian Medical Graduate which is highlighted in this scenario. Enlist the other roles of Indian Medical Graduate. (1+4)	(5)

Short Answer Questions: 3 X 5 = 15

Answer all the questions.

33			Justify why British Anti-lewisite Dimercaprol (BAL) is used as an antidote to treat heavy metal poisoning.	(3)
34			Justify why alcohol consumption leads to hypoglycemia.	(3)
35			How do dietary fibers regulate body weight?	(3)
36			Justify the statement " Prophylactic dose of Vit K is given to premature infants "	(3)

37			NADPH maintains integrity of RBC membrane . Justify.	(3)

-----End-----

Exam Date & Time: 09-Sep-2025 (09:30 AM - 12:30 PM)

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

MBBS Phase - I Degree Examination
September 2025 QP CODE: A006

Biochemistry Paper 2 [BIO2]

Marks: 100 **Duration: 180 mins.**

MCQ: 20 X 1 = 20

Answer all the questions. Section Duration: 30 mins

1 Wilson's disease is a condition of toxicosis of (1)

1) Iron	2) Copper	3) Chromium	4) Molybdenum

2 All statements regarding Transamination are correct **EXCEPT** (1)

1) Irreversible process	2) Reversible process	3) Pyridoxal phosphate	4) Alpha-ketoglutarate

3 A 6-year-old boy presents with facial puffiness (especially in the morning), ankle swelling and frothy urine. Laboratory findings suggest diagnosis of Nephrotic syndrome. Which of the following liver function test is **CORRECT** in this case? (1)

1) Increased alanine aminotransferase activity	2) Increased Total bilirubin in serum	3) Deceased alkaline phosphatase activity	4) Decreased albumin in serum

4 During inflammation the neutrophils release super oxide free radical during phagocytosis. Which biochemical process is responsible for this? (1)

1) Respiratory burst	2) Respiratory distress	3) Chemotaxis	4) Oxidative phosphorylation

5 A point mutation in the beta globin gene changing the codon from glutamate to valine will likely cause which of the disease? (1)

1) Sickle cell anemia	2) Methemoglobinemia	3) Thalassemia	4) Cooley Hb

6 In patients with renal failure all of the following are typically elevated in serum, **EXCEPT** (1)

1) Urea nitrogen	2) Creatinine	3) Uric acid	4) Albumin

7 A good source of Iron is (1)

1) Milk	2) Spinach	3) Tomato	4) Potato

8 A 6-year-old child presents to the hospital with yellow discoloration of eyes and loss of appetite and general malaise for past 1 week. Peripheral smear revealed sickle shaped RBCs. Mention the type of Jaundice in this child. (1)

1) Hepatic Jaundice	2) Physiological Jaundice	3) Pre-Hepatic Jaundice	4) Obstructive Jaundice

9 The separation of parental DNA strands during replication is carried out by which of the following enzyme? (1)

1) DNA synthase	2) DNA helicase	3) DNA polymerase	4) DNA ligase

10 A 65-year-old man presents with bone pain, fatigue, and recurrent infections. He is diagnosed with (1)

Multiple Myeloma. Which protein is found to be elevated in urine sample in this case?

1)	Albumin	2)	Globulin	3)	Bence Jones protein	4)	Tamm-Horsfall protein

11 In chronic alcoholism which of the following enzyme level is elevated? (1)

1)	Alanine transaminase	2)	Aspartate transaminase	3)	Alkaline phosphatase	4)	Gamma-glutamyl transferase

12 Which of the following technique can be used to achieve the Gene amplification? (1)

1)	Southern blotting	2)	DNA finger printing	3)	Polymerase chain reaction	4)	Northern blotting

13 A genetic disorder that can cause pulmonary emphysema even in the absence of cigarette use is due to deficiency of (1)

1)	Proline hydroxylase	2)	α1-antitrypsin	3)	Dietary vitamin C	4)	Elastase activity

14 Serotonin is derived from which of the following amino acid? (1)

1)	Tyrosine	2)	Tryptophan	3)	Glutamic acid	4)	Histidine

15 Elongation of polypeptide chain requires all of the following **EXCEPT** (1)

1)	Peptidyl transferase	2)	GTPase	3)	Translocase	4)	Rho factor

16 A patient is taking medication that is metabolized by liver enzyme Cytochrome P450. Which phase of biotransformation is Cytochrome P450 involved in? (1)

1)	Phase-I	2)	Phase-II	3)	Phase-III	4)	All of the above

17 Which one of the following nucleotide bases is **NOT** present in codons? (1)

1)	Adenine	2)	Guanine	3)	Thymine	4)	Cytosine

18 The parent nucleotide in the de novo synthesis of purine nucleotide is (1)

1)	AMP (adenosine monophosphate)	2)	GMP (guanosine monophosphate)	3)	XMP (xanthosine monophosphate)	4)	IMP (inosine monophosphate)

19 A 10-year-old girl is brought by her parents with complains of freckles on her face, neck, arms and hands. She was found to be sensitive to sunlight. On referring to a tertiary care hospital a diagnosis of Xeroderma Pigmentosa was given. Which mechanism of DNA repair is affected in this child? (1)

1)	Mismatch Repair Defect	2)	Base excision repair	3)	Nucleotide excision repair	4)	Double strand break repair

20 The **most** important natural antioxidant is (1)

1)	Vitamin B12	2)	Vitamin E	3)	Vitamin D	4)	Vitamin K

Long Essay Questions: 10 X 1 = 10

Answer all the questions.

21 A 30-year-old woman with acute myeloid leukaemia (AML) receives Etoposide as part of her induction chemotherapy regimen. During treatment, her blood tests show severe neutropenia.
a) How does Etoposide interfere with DNA replication in human cells?
b) Discuss in detail the steps of DNA replication in eukaryotes?
c) Why does the patient develop neutropenia as side effect of Etoposide? (2+6+2) (10)

Short Essay Questions: 11 X 5 = 55

Answer all the questions.

22 a) Justify the statement ' Alpha Thalassemia is more fatal than Beta Thalassemia. (5)

b) List the clinical manifestations of Thalassemias.
c) Mention the type of jaundice seen in Thalassemias. (2+2+1)

23			A 60-year-old male with chronic kidney disease (CKD) presents with uncontrolled blood pressure (170/105 mmHg). He was asked to get the following investigations and the report was as follows: Serum creatinine- 4mg/dl (0.7-1.4mg/dl) Blood urea- 60mg/dl (20-40 mg/dl) Glomerular filtration rate (GFR)-70 mL/min (95-115 mL/min) a) How does impaired renal function lead to hypertension? b) What is the rationale behind assessing creatinine and urea in renal function? c) How does reduced eGFR affect electrolyte balance? (2+2+1)	(5)
24			Explain the **four** phases of Renal regulation of blood pH.	(5)
25			A 20 year old female is admitted to medicine department with tremors in hand and uncoordinated limb movements. Her eyes showed golden brown ring around corneal rim which was confirmed as KF ring (Kayser- Fleischer ring) on slit lamp examination. Laboratory investigations revealed low serum Ceruloplasmin levels. a) What could be the probable diagnosis and mention the gene defect in this condition? b) Mention any **three** functions of the mineral associated with this disorder. (2+3)	(5)
26			Explain the prokaryotic regulation of gene expression with Lac Operon model.	(5)
27			Define Clearance tests. Mention the exogenous and endogenous markers to estimate clearance to assess glomerular function. (1+4)	(5)
28			A 55-year-old male, presents to the clinic with a history of sudden onset severe pain, redness and swelling in his big toe. He reports about intense pain in his big toe. He has experienced similar episodes over the past year. His dietary history reveals a high intake of red meat and regularly consumes alcohol. Laboratory investigations show elevated serum uric acid levels. He was diagnosed as a case of Primary Gout. a) Explain the reason behind the intense pain and inflammation experienced in gout on consumption of red meat and alcohol b) Enlist **two** causes for primary gout. (3+2)	(5)
29			Mention the normal serum sodium level. Mention **four** causes and **two** clinical manifestations of hyponatremia. (1+2+2)	(5)
30			A 2 month old baby was brought by parents to the paediatrician. She had pale skin and blonde hair.The baby was otherwise healthy and was feeding well but was unable to fix the gaze. Ophthalmic examination showed absence of pigment in the retina. Two siblings had similar presentations, but parents were normal. a) What is the probable diagnosis? b) Name the enzyme defect. c) Outline the biochemical steps of melanin synthesis ? (1+1+3)	(5)
31			A 10-year-old child receives the first dose of Hepatitis B vaccine. a) Which type of immunity is induced by this vaccine? b) Name the type of antigen-presenting cells involved in initiating this immune response. c) What class of immunoglobulin is produced first in primary response? d) How does the secondary immune response differ from the primary response? (1+1+1+2)	(5)
32			Describe professional qualities and roles of a physician.	(5)

Short Answer Questions: 3 X 5 = 15

Answer all the questions.

33			Give reasons why there is switch from fetal haemoglobin to adult haemoglobin in few days after birth.	(3)
34			Metabolic acidosis is seen in cases of renal failure. Give reasons.	(3)

35			Tyrosine is a non-essential amino acid. Give reason.	(3)
36			Justify the statement "DNA replication has high fidelity"?	(3)
37			Copper deficiency can result in microcytic anemia. Justify.	(3)

-----End-----

Exam Date & Time: 05-Sep-2025 (09:30 AM - 12:30 PM)

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

MBBS Phase - I Degree Examination
September 2025 QP CODE: A003

Physiology Paper 1 [PHY1]

Marks: 100 **Duration: 180 mins.**

MCQ: 20 X 1 = 20

Answer all the questions. Section Duration: 30 mins

1 A patient is diagnosed with peptic ulcer disease and is advised antacids blocking the pump secreting gastric juice. Identify the pump blocked in this case. (1)

1)	Na^+K^+ ATPase pump		2)	H^+HCO_3- exchanger		3)	H^+K^+ ATPase pump		4)	H^+Cl^- ATPase pump	

2 A 25 year old female complains episodes of her heart rate racing especially when she takes deep breaths. On examination her heart rate is noted to vary with her breathing cycle increasing during inspiration and decreasing during expiration. Which of the following condition is likely to be responsible for her condition? (1)

1)	Sinus tachycardia		2)	Sinus bradycardia		3)	Atrial fibrillation		4)	Sinus arrhythmia	

3 A 40 year old female presented with polymenorrhoea and generalised weakness. She also complained of palpitations and irritability. On examination the nails were spoon shaped and blood picture showed microcytic hypochromic anemia. The type of anaemia in this case is (1)

1)	Iron deficiency anaemia		2)	Pernicious anaemia		3)	Megaloblastic anaemia		4)	Vitamin B12 deficiency anaemia	

4 A 75-year-old man worked for more than 30 years in a factory where asbestos was used as an insulator. The man is diagnosed with asbestosis (restrictive lung disease). Which set of changes are present in this man compared with a person with healthy lungs? (1)

1)	FEV1 is decreased, FVC is normal		2)	FEV1 is decreased, FVC is increased		3)	FEV1 is normal, FVC is decreased		4)	FEV1 is increased, FVC is decreased	

5 A 55 year-old female patient has urinary incontinence. Her past medical history is notable for type 2 diabetes mellitus and hypertension.The **most** likely cause for her bladder abnormality is (1)

1)	Impaired parasympathetic innervation of the bladder		2)	Impaired sympathetic innervation of the bladder		3)	Peripheral vascular disease causing reduced blood supply to the urethra		4)	Abnormal connection between the bladder and vagina	

6 Apoptosis inducing factor is located in which of the following cell organelle? (1)

1)	Nucleus		2)	Mitochondria		3)	Golgi apparatus		4)	Ribosomes	

7 The immunoglobulin that provides local protection is (1)

1)	IgG		2)	IgA		3)	IgM		4)	IgD	

8 Major cross-matching is a reaction between (1)

1)	Donor's cells		2)	Donor's cells		3)	Donor's plasma		4)	Donor's plasma	

	and recipient's plasma			and recipient's cells			and recipient's cells			and recipient's plasma	

9 Gastrin secretion is increased by

1)	Increased fat ingestion		2)	Vagal stimulation		3)	Bile salts		4)	Sympathetic stimulation	

(1)

10 In infants defecation often follows a meal, this is due to

1)	Gastroileal reflex		2)	Gastrocolic reflex		3)	Enterogastric reflex		4)	Gastro-esophageal reflex	

(1)

11 Gastric mucosal barrier is disrupted by

1)	Mucus		2)	Bicarbonate		3)	Aspirin		4)	Prostaglandins	

(1)

12 'a' wave in the jugular venous pulse is due to

1)	Atrial systole		2)	Ventricular systole		3)	Atrial diastole		4)	Ventricular diastole	

(1)

13 Parasympathetic stimulation of heart causes

1)	Decreased rate of SAN		2)	Increased excitability of AV junctional fibres		3)	Prevents ventricular contraction		4)	Decrease in the End Systolic Volume	

(1)

14 Normal total delay of the cardiac impulse in the AV node + bundle of His is

1)	0.13 second		2)	0.22 second		3)	0.18 second		4)	0.16 second	

(1)

15 Cystometrogram is a measure of

1)	Intrarenal pressure		2)	Pressure volume relationship in bladder		3)	Pressure volume relationship in lungs		4)	Renal plasma flow	

(1)

16 Loop-diuretics inhibit

1)	Na^+- glucose co-transport		2)	Na^+- K^+- $2Cl^-$ co transport		3)	Na^+- Cl^- co-transport		4)	Na^+- K^+ exchange	

(1)

17 VA / Q ratio is **more** than one in

1)	Apex of the lung		2)	Base of the lung		3)	Middle of the lung		4)	In all three zones	

(1)

18 Artificial respiration recommended for maximum advantage in emergency is

1)	Mouth to mouth method		2)	Schaffer's method		3)	Sylvester's method		4)	Drinker's method	

(1)

19 FEV1 is decreased in

1)	Pleural effusion		2)	Bronchial asthma		3)	Sarcoidosis		4)	Pulmonary fibrosis	

(1)

20 During acclimatization to high altitude there is

1)	Respiratory alkalosis		2)	Decrease in P_{50}		3)	Decrease in RBC 2-3 DPG		4)	Decreased secretion of erythropoietin	

(1)

Long Essay Questions: 10 X 1 = 10

Answer all the questions.

21 A 40-year old male complains of severe left sided chest pain radiating to his left arm and hand. He is suspected to have myocardial infarction. An Electrocardiogram (ECG) is done. (10)

a) Describe the waves, segments and intervals of normal ECG in lead II with a neat labelled diagram.
b) Explain the changes in ECG most likely to be present in MI.
c) List the unique features of coronary circulation. (5+2+3)

Short Essay Questions: 11 X 5 = 55

Answer all the questions.

22			A 55 year old lady complains of progressive dysphagia for solid foods since last 6 months. She also has loss of appetite and loss of weight. Endoscopy reveals residual food particles accumulated at the lower esophagus, with dilated lower esophagus. Barium swallow shows bird beak appearance on X-ray. a) What is the diagnosis of the above condition? b) Describe the second stage of deglutition? (1+4)	(5)
23			A 60 year old male, a known case of hypertension came to OPD with a complaint of heaviness in head. On examination his Pulse rate was 72/min and B.P was 160/100mmHg. ECG showed left ventricular hypertrophy. Describe the short term mechanisms for regulation of Blood Pressure.	(5)
24			A worker employed for deep sea cable laying complained of severe joint pains, dizziness and confusion after rapid ascent to the sea level. Identify the condition. Explain the cause and physiological basis of signs and symptoms in this case. (1+4)	(5)
25			A 12 year old boy presents with generalized edema and his GFR is decreased by 50%. a) What is GFR? Mention its normal value. b) Describe the factors that regulate GFR. (1+4)	(5)
26			A 34 year old female gave the history of ecchymoses, petechiae and hematuria since last 2 days. She had noted headaches, nausea and increasing dysphoria over the past week. CBC showed 1. RBC 2.38 x 1012/L 2. HGB 6.6 g/dL 3. MCV 77.5 fL 4. MCH 27.7 pg 5. MCHC 35.8 g/dL 6. WBC 16.9 x 109/L 7. PLATELETS = 80,000 cells /cubmm a) Identify the above condition. b) Describe the role of platelets in haemostasis (1+4)	(5)
27			Describe the defecation reflex.	(5)
28			Describe the pressure volume changes occuring during breathing cycle.	(5)
29			Classify body fluid compartments with their normal values. Add a note on measurement of ECF. (2+3)	(5)
30			Describe chemical regulation of respiration.	(5)
31			Define anemia. Explain the morphological classification of anemia.	(5)
32			Describe professional qualities and roles of a physician.	(5)

Short Answer Questions: 3 X 5 = 15

Answer all the questions.

33			Give reasons why bulky clay colored stools are seen in obstructive jaundice.	(3)
34			Explain why Sinu-atrial node (SAN) is the primary pacemaker of the heart.	(3)

35			Explain how high protein diet increases the ability of kidneys to concentrate the urine.	(3)
36			Give reasons why clotting time is prolonged in vitamin K deficiency and liver diseases?	(3)
37			Reason out why cyanosis is **NOT** seen in anaemic and histotoxic hypoxia.	(3)

-----End-----

Exam Date & Time: 06-Sep-2025 (09:30 AM - 12:30 PM)

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

MBBS Phase - I Degree Examination
September 2025 QP CODE: A004

Physiology Paper 2 [PHY2]

Marks: 100 **Duration: 180 mins.**

MCQ: 20 X 1 = 20

Answer all the questions. Section Duration: 30 mins

1 A 22-year-old woman with a regular 28-day menstrual cycle reports mid-cycle abdominal discomfort and a thin, stretchy vaginal discharge. A surge in luteinizing hormone (LH) is observed on her hormonal profile. Basal body temperature rises slightly the following day.Which of the following sentence is **true**? (1)

1)	Proliferation of the endometrial stroma		2)	Ovulation due to LH surge		3)	Peak secretion of progesterone		4)	Onset of menstruation due to falling estrogen and progesterone	

2 Blood Testis Barrier in human beings is derived from (1)

1)	Leydig Cells		2)	Sertoli Cells		3)	Germinal Cells		4)	Tunica Albuginea	

3 Primordial follicle is converted into primary follicle (1)

1)	In intrauterine life		2)	At birth		3)	At puberty		4)	After menopause	

4 Lactational amenorrhoea occurs due to

1)	High level of Prolactin		2)	High level of Luteinizing hormone		3)	High level of Oxytocin		4)	High level of Follicle stimulating hormone	

(1)

5 A person eats something sour like lemon juice and experiences a sharp taste sensation. Which type of ion directly contributes to this sour taste perception? (1)

1)	Sodium ions		2)	Chloride ions		3)	Hydrogen ions		4)	Potassium ions	

6 Basal part of the basilar membrane responds to (1)

1)	High pitch sound		2)	Low pitch sound		3)	No sound		4)	Medium pitch sound	

7 Aqueous humor differ from plasma in that it contains

1)	High protein		2)	High content of vitamin C & NaCl		3)	High glucose		4)	Low lactic acid	

(1)

8 A woman in labor experiences uterine contractions that become stronger and more frequent as labor progresses. Which hormone is involved in stimulating uterine contractions through a positive feedback mechanism? (1)

1)	Prolactin		2)	Estrogen		3)	Oxytocin		4)	FSH	

9 Which of the following would you expect to find in a patient whose diet has been low in calcium for 2 months? (1)

1)	Increased formation of 24,25-dihydroxycholecalciferol		2)	Decreased amounts of calcium-binding		3)	Increased parathyroid hormone secretion		4)	High plasma calcitonin concentration	

				protein in intestinal epithelial cells									

10 Reverse T3 is

1)	Secretion from T4 having no hormonal action		2)	Secreted from T4 having hormonal action		3)	Principal hormone secreted by thyroid		4)	More active than T3		(1)

11 Hormone that use the Adenyly Cyclase - cAMP second messenger system is

1)	ACTH		2)	Insulin		3)	Aldosterone		4)	Melatonin		(1)

12 Non-osmotic stimulation for ADH secretion is due to

1)	Uremia		2)	Hyperglycemia		3)	Hemorrhage		4)	Excessive water ingestion		(1)

13 Which sleep stage is **most** closely associated with vivid dreams and rapid eye movements?

1)	Stage N1 (light sleep)		2)	Stage N2 (spindles and K-complexes)		3)	Stage N3 (deep sleep)		4)	REM sleep		(1)

14 Which of the following is a preganglionic sympathetic neurotransmitter?

1)	Glycine		2)	Adrenaline		3)	Norepinephrine		4)	Acetylcholine		(1)

15 Major neurotransmitter in substantia nigra is

1)	Dopamine		2)	Noradrenaline		3)	Serotonin		4)	Acetylcholine		(1)

16 Modality that is **lost** on ipsilateral side in Brown Sequard syndrome is

1)	Pain		2)	Temperature		3)	Crude touch		4)	Proprioception		(1)

17 One of the following is a property at the synapse

1)	Law of forward conduction		2)	Law of projection		3)	All or none law		4)	Law of adequate stimulus		(1)

18 A patient receives an injection of a drug that blocks nicotinic acetylcholine receptors at the neuromuscular junction. Which of the following effects is **most** likely to occur?

1)	Increased muscle tone		2)	Enhanced acetylcholine breakdown		3)	Inhibition of muscle contraction		4)	Sustained depolarization of the sarcolemma		(1)

19 **Most** diffusible ion in excitable tissue is

1)	Na^+		2)	K^+		3)	PO_4		4)	Cl^-		(1)

20 Nerve fibers involved in proprioception is

1)	Type A fiber		2)	Type B fiber		3)	Type C fiber		4)	Type IV fiber		(1)

Long Essay Questions: 10 X 1 = 10

Answer all the questions.

21			A 20-year-old medical student notices that his friend is walking with an unsteady, wide-based gait. During a practical examination, you observe that he cannot perform rapid alternating movements smoothly and has difficulty touching his nose with his finger when asked to do so. His speech sounds irregular and scanning in nature. a) Name the main functional divisions of the Cerebellum and correlate them with their primary roles. b) Describe the connections and functions of Cerebellum. c) Add a note on cerebellar lesions and additional features other than observed in the above case. (3+5+2)	(10)

Short Essay Questions: 11 X 5 = 55

Answer all the questions.

22			A 30-year-old female patient is diagnosed with a condition that affects the release of neurotransmitters from her neurons. Her doctor explains that neurotransmitters play a crucial role in transmitting signals between neurons. a) Describe the process of neuromuscular transmission with a neat labelled diagram. b) Name any **two** neuromuscular blockers with physiological basis of their action. (4+1)	(5)
23			Describe the effects of injury on nerve fibers, including the initial response to injury, degeneration and regeneration.	(5)
24			A 25-year-old patient is experiencing symptoms of phantom limb pain after a traumatic amputation. Explain the physiological mechanisms underlying the sensory cortex and its role in processing somatosensory information. Describe how changes in the sensory cortex can contribute to the development of phantom limb pain.	(5)
25			A 20-year-old boy comes to the clinic with symptoms of defective color vision and having trouble in distinguishing between red and green colors. Explain the physiological mechanisms underlying color vision, including the role of cone cells and the visual pathway. Describe how abnormalities in the cone cells can lead to color vision deficiency. (3+2)	(5)
26			Explain functions of middle ear.	(5)
27			Discuss the fundamentals of doctor patient relationship.	(5)
28			A 50-year-old male patient diagnosed with diabetes mellitus is brought to the clinic with symptoms of polyphagia, polydypsia and polyuria. Describe the physiological basis of these symptoms in this patient.	(5)
29			Explain the physiological basis of features in Cushing's syndrome.	(5)
30			State the hormones secreted by posterior pituitary gland. Explain milk ejection reflex in detail.	(5)
31			Explain the Physiological changes that occur during Pregnancy.	(5)
32			A 30-year-old male patient is diagnosed with oligospermia and is found to have low sperm count and motility. Explain the physiological mechanisms underlying spermatogenesis and the regulation of sperm production with applied physiology.	(5)

Short Answer Questions: 3 X 5 = 15

Answer all the questions.

33			Why does rigor mortis occur after death in skeletal muscles? Explain the role of ATP.	(3)
34			Radiologists and aircraft pilots wear red goggles when in bright light, give physiological reasons.	(3)
35			REM sleep is called paradoxical sleep, why?	(3)
36			Why is it important for sperm to undergo capacitation before fertilizing an egg?	(3)

37			Why neuromuscular hyperexcitability is observed in tetany?	(3)

-----End-----