

**Time: Three Hours**

**Max. Marks: 100 Marks**

**ANATOMY – PAPER - I (RS-4)**

**Q.P. CODE: 1020**

**(QP contains two pages)**

Your answers should be specific to the questions asked  
Draw neat, labeled diagrams wherever necessary

**LONG ESSAYS**

**2 x 10 = 20 Marks**

1. Describe a typical intercostal space under the following headings:  
a) Definition; b) Boundaries; c) Contents (1+2+4)  
Explain where a needle is inserted into the intercostal space to drain a pleural effusion and the anatomical basis for the same. Name the structures in order from the skin to the pleura that must be pierced in order to enter the pleural cavity (0.5+0.5+2)
2. Describe the larynx under the following headings:  
a) Cavity; b) Actions of the intrinsic muscles; c) Nerve supply (2+3+2)  
Explain the anatomical basis of injuries to the nerves supplying the larynx during thyroid surgeries. (3)

**SHORT ESSAYS**

**10 x 5 = 50 Marks**

3. Describe the origin, course, branches and termination of the musculocutaneous nerve. Explain why the motor distribution of the musculocutaneous nerve is affected in Erb's palsy. (0.5+2+1+0.5+1)
4. A 30-year-old cricketer felt moderate pain in the right shoulder for the last two weeks. The pain was severe enough to prevent him from bowling. He visited a sports medicine specialist who observed that maximum pain was felt in the mid-range of abduction. A diagnosis of rotator cuff tendinitis was made.
  - a. Describe the components of the rotator cuff.
  - b. Explain the functional importance of the rotator cuff.
  - c. Explain the anatomical basis for the maximum pain felt in the mid-range of abduction. (2+1+2)
5. Describe the movements of the scapula and the muscles causing them. Explain the anatomical basis of winging of the scapula. (2+2+1)
6. Describe the formation, course, termination and drainage areas of the thoracic duct. Explain how stab injuries to the left side of the neck can damage the thoracic duct. (0.5+1+0.5+2+1)
7. Describe the attachments, actions and nerve supply of the muscles of the soft palate. Explain the role of the soft palate in deglutition. (2+1+1+1)
8. Describe the movements that occur at the atlanto-occipital and median atlanto-axial joints and the muscles causing them. Explain the mechanism by which movements occur at the median atlanto-axial joint. (2+2+1)
9. Draw a neat, labelled diagram of the cross-section of the spinal cord at the mid-thoracic level. Explain the functional importance of the dorsal columns. (4+1)

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10. Describe the extent, gross features and relations of the hypothalamus. Explain the functional importance of the hypothalamic-hypophyseal portal system. (1+1+2+1)
11. Describe the development of the umbilical cord. Explain why the umbilical arteries carry deoxygenated blood and umbilical veins carry oxygenated blood. (4+1)
12. Compare and contrast the light microscopic features of serous and mucous acini.

## SHORT ANSWERS

10 x 3 = 30 Marks

13. A 30-year-old lady had to get blood drawn for some routine blood tests. At the hospital lab, the technician selected a vein that ran across the roof of the cubital fossa for the collection of blood.
  - a. Which vein did the technician select for drawing blood?
  - b. Explain the anatomical basis for the selection of this vein. (1+2)
14. Describe the location, formation and termination of the coronary sinus. (1+1+1)
15. Describe the lymphatic drainage of the lungs.
16. Name six branches of the external carotid artery.
17. Name the bones that contribute to the lateral wall of the nasal cavity. Explain the functional importance of the turbinates. (2+1)
18. Describe the attachments and extensions of the pre-vertebral fascia. (2+1)
19. Describe the anatomical basis for performing a lumbar puncture at the L3/L4 interspinous level.
20. Describe the three types of anastomoses with suitable examples. (1.5+1.5)
21. Describe the components of the blood-brain barrier. Explain its functional importance. (1.5+1.5)
22. Draw a neat, labelled diagram of a blastocyst.

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**MBBS Phase – I (CBME) Degree Examination - 10-Feb-2021**

**Time: Three Hours**

**Max. Marks: 100 Marks**

**ANATOMY – PAPER - II (RS-4)**

**Q.P. CODE: 1021**

**(QP contains two pages)**

Your answers should be specific to the questions asked.  
Draw neat, labeled diagrams wherever necessary.

**LONG ESSAYS**

**2 x 10 = 20 Marks**

1. A 14-year-old boy came with altered gait a few hours after an injection in his right buttock. On clinical examination he was found to be having right foot drop.
  - a. What is the anatomical basis for the boy's symptoms? (2)
  - b. Describe the following structures under the cover of the gluteus maximus muscle  
(i) Vessels (4+4)  
(ii) Nerves (3+3+2)
2. Draw a neat labelled diagram to show the components of the extra-hepatic biliary system. (2)  
Describe the gall bladder under the following headings:  
(a) Location; (b) Parts; (c) Relations; (d) Blood supply; (e) Applied anatomy (1+1+3+2+1)

**SHORT ESSAYS**

**10 x 5 = 50 Marks**

3. A 23-year-old female came to the emergency department with an injury to the middle of the right groin region. On examination, there was a deep lacerated wound just below the middle of the right inguinal ligament. Describe the structures at risk in this region and their relations. Describe the boundaries of the triangle in this region. (3+2)
4. A 26-year-old male presented to the emergency department with complaints of pain in the umbilical region which later shifted to the right iliac fossa. There was tenderness elicited at McBurney's point. A clinical diagnosis of acute appendicitis was made.
  - (a) Explain the anatomical basis of the pain that was initially felt in the umbilical region.
  - (b) Explain why the pain later shifted to the right iliac fossa.
  - (c) What is McBurney's point and its clinical importance?
  - (d) Describe the positions of the appendix.
  - (e) Describe the arterial supply of the appendix. (1+1+1+1+1)
5. Describe the layers and attachment of the thoracolumbar fascia. (3+2)
6. Describe the relations of the abdominal parts of both ureters and their arterial supply. (3+2)
7. Compare and contrast the features of the male and female bony pelvis.
8. Describe the perineal membrane and the structures piercing it in males and females. (3+1+1)

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9. Describe the supports of the urinary bladder.
10. Compare and contrast the features of autosomal dominant and autosomal recessive inheritance.
11. Correlate the microstructure and functions of the adrenal cortex.
12. Describe the development of the kidney. Explain the embryological basis of congenital polycystic kidney. (4+1)

## SHORT ANSWERS

**10 x 3 = 30 Marks**

13. The obturator nerve was injured in an anterior dislocation of hip joint. All the muscles supplied by this nerve were paralyzed except part of one muscle. Which muscle is this and what is the anatomical basis? Enumerate the muscles supplied by the obturator nerve. (2+1)
14. Describe the lymphatic drainage of the stomach.
15. Describe the interior of the second part of the duodenum.
16. Describe briefly the boundaries and contents of the pudendal canal. (2+1)
17. Describe the peritoneal relations of the rectum and their clinical importance. (2+1)
18. Explain the mechanism of meiotic non-disjunction and its consequences. (2+1)
19. Describe the structure and functions of Sertoli cells.
20. Describe the histological appearance of thyroid follicles in different stages of activity.
21. Explain the embryological basis of Meckel's diverticulum.
22. Explain the embryological basis of tracheo-oesophageal fistula.

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## MBBS Phase - I (CBME) Degree Examination - 12-Feb-2021

Time: Three Hours

Max. Marks: 100 Marks

### PHYSIOLOGY – PAPER- I (RS-4)

Q.P. CODE: 1022

Your answers should be specific to the questions asked  
Draw neat, labeled diagrams wherever necessary

#### LONG ESSAYS

2 x 10 = 20 Marks

1. Mention the events of a cardiac cycle with their durations. Explain the left ventricular pressure and volume changes during cardiac cycle. (3+7)
2. Name the neural regulatory centers of respiration and explain their role in regulation. Illustrate Cheyne-Stokes breathing. (3+4+3)

#### SHORT ESSAYS

10 x 5 = 50 Marks

3. Explain feedback regulation with suitable examples. (2.5+2.5)
4. Describe the effects of mismatched blood transfusion. (5)
5. A 16 year old boy was brought to the hospital with excessive bleeding from an injury in his foot. He had a past history of similar delayed stoppage of bleeding associated with swelling of injured parts following blunt trauma. One of his paternal uncles also had a similar history. Investigation revealed: Hb 14 g/dl, Platelet count 3.5 lakhs/mm<sup>3</sup>, BT - 5 minutes, CT - 12 minutes.
  - a. Mention the probable diagnosis and cause for the same.
  - b. Mention the type of inheritance of this disorder.
  - c. Name another bleeding disorder with the cause. (2+1+2)
6. Explain the role of complement system in immunity. (5)
7. Explain the role of renin-angiotensin-aldosterone system in BP regulation. (5)
8. List the theories of auto-regulation of blood flow and explain any two. (2+3)
9. Define and classify hypoxia. Explain their causes and treatment. (2+3)
10. Describe the defecation reflex with illustration. (5)
11. Explain the cause for splay in reabsorption of glucose by Nephrons. (5)
12. Define GFR. Explain the factors regulating the same. (1+4)

#### SHORT ANSWERS

10 x 3 = 30 Marks

13. List the functions of WBCs. (3)
14. Explain the basis of enhanced immune response to booster doses of vaccine. (3)
15. Mention the symptoms and ECG changes in ischemic heart disease. (2+1)
16. Illustrate and mention the physiological basis of radial pulse tracing. (3)
17. Define functional residual capacity. Mention its normal value and methods for its measurement. (1+1+1)
18. Mention the composition and functions of bile. (1.5+1.5)
19. Define jaundice. Mention the clinical features of obstructive jaundice. (1+2)
20. Mention its cause and treatment of achalasia cardia. ~~(1+1+1)~~ (1.5+1.5)
21. Compare and contrast cortical and juxta-medullary Nephrons. (3)
22. Mention the sites of water reabsorption in Nephrons with its principle. (3)



**Rajiv Gandhi University of Health Sciences, Karnataka**  
**MBBS Phase – I (CBME) Degree Examination - 15-Feb-2021**

**Time: Three Hours**

**Max. Marks: 100 Marks**

**PHYSIOLOGY – PAPER - II (RS-4)**

**Q.P. CODE: 1023**

Your answers should be specific to the questions asked  
Draw neat, labeled diagrams wherever necessary

**LONG ESSAYS**

**2 x 10 = 20 Marks**

1. List adrenal gland hormones? Describe in detail about the actions of corticosteroids. Mention the clinical features of Addison's disease.  
(2+3+3+2=10)  
2+6+2
2. Describe the circulation and functions of cerebrospinal fluid (CSF). Tabulate the composition of CSF against plasma. Discuss the clinical applications of CSF analysis.  
(2+2+3+3=10)

**SHORT ESSAYS**

**10 x 5 = 50 Marks**

3. Compare fast pain with slow pain.
4. Differentiate between pyramidal and extrapyramidal tracts.
5. Mention the functions of Basal Ganglia.
6. Illustrate the stages of follicular growth in an ovarian cycle.
7. Describe the structure and functions of the placenta.
8. Describe physiological effects of physical training.
9. Explain the disorders of visual field in relation to visual pathway.
10. A patient comes with a history of excessive drinking of water and passing of excess of colorless urine very frequently. Investigation revealed that the patient passed about 15 litre of urine in 24 hours. The urine was colorless, there was no sugar, blood or albumin in the urine.
  - a. What is your diagnosis?
  - b. What is the cause for the development of polyuria and polydipsia?
  - c. In what other conditions polyuria occurs?
  - d. How do you manage the condition?(1+1+2+1)
11. Describe the actions of growth hormone.
12. Enumerate the sequence of event involved in the transmission of nerve impulse.

**SHORT ANSWERS**

**10 x 3 = 30 Marks**

13. Why a nerve fiber cannot be fatigued?
14. What are the contraindications for the use of oral contraceptives?
15. List the factors affecting nerve regeneration.
16. How length servomechanism operates to maintain muscle length?
17. Explain renshaw cell inhibition.
18. Why thalamus is called the sensory relay station?
19. List the beneficial effects of fever.
20. Mention the different types of glaucoma.
21. Mention the tuning fork tests used to assess deafness.
22. Distinguish between fast and slow muscle fibers.

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**Rajiv Gandhi University of Health Sciences, Karnataka**  
**MBBS Phase – I (CBME) Degree Examination - 17-Feb-2021**

**Time: Three Hours**

**Max. Marks: 100 Marks**

**BIOCHEMISTRY – PAPER I (RS-4)**

**QP Code: 1024**

**(QP contains two pages)**

Your answers should be specific to the questions asked  
Draw neat labeled diagrams wherever necessary

**LONG ESSAYS**

**2 x 10 = 20 Marks**

1. Define lipoproteins? Mention the different lipoproteins involved in transport of lipids. Explain metabolism of dietary lipids under the following heading.
  - a. Assembly of dietary lipids
  - b. Transport
  - c. Utilization in peripheral tissues
  - d. Metabolic fate

[1+1+2+2+2+2]
2. A 12 year old girl presented with stiffness and tingling of hands and feet, carpopedal spasm. On examination trousseau's sign was positive, chvostek's sign was positive. On laboratory evaluation, serum calcium was significantly reduced.
  - a. Interpret the findings and suggest the probable diagnosis?
  - b. Mention the reference range and dietary sources of the nutrient.
  - c. Explain the role of hormones in regulating the blood levels of this nutrient.
  - d. Mention any 6 biochemical functions of this nutrient

(1+2+4+3)

**SHORT ESSAYS**

**10 x 5 = 50 Marks**

3. What are mucopolysaccharides?
  - a. Name the mucopolysaccharide present in the glomerular basement membrane. What is its significance?
  - b. Explain the biochemical basis of heparin as anticoagulant.
  - c. Write the composition and importance of chondroitin sulphate?
  - d. Which mucopolysaccharide maintains the transparency of cornea?

(1+1+1+1+1)
4. Define oxidative phosphorylation? Explain chemiosmotic hypothesis with a neat labelled diagram.

(1+2+2)
5. A 10 year old boy had difficulty in vision at night. However his vision was quite normal during daytime except when he entered a dimly lit room. On investigation, his plasma retinol levels were found to be low.
  - a. Suggest the probable diagnosis? Which nutrient deficiency causes this disease? (1)
  - b. Enumerate any four functions of the nutrient. (2)
  - c. Explain Walds visual cycle (2)
6. What is calorific value? Calculate the energy requirement of a 50 year old moderate worker.

(1+4)
7. Explain the effect of temperature and substrate concentration on enzyme activity with a graph.

(2+3)
8. Explain Fluid mosaic model of cell membrane with a neat labelled diagram.



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9. A 5 year old girl was brought to the hospital with enlarged abdomen. History revealed that her childhood development was comparatively slow, frequently hungry, lethargic and irritable. Clinical examination showed enlarged liver. Biochemical investigations of blood sample revealed reduced fasting blood glucose levels and elevated levels of serum lactate, triglyceride and uric acid
- Suggest the probable diagnosis?
  - Name the enzyme defect?
  - What is the biochemical basis for fasting hypoglycemia, lactic acidosis and hyperuricemia in this condition? (1+1+3)
10. What is metabolic alkalosis? Mention four causes of metabolic alkalosis. Explain the Compensatory mechanism. (1+2+2)
11. Explain the metabolic adaptations occurring in the liver and adipose tissue in a well-fed state.
12. What are isoenzymes? Write the isoenzymes of CPK with tissue distribution. Which isoenzyme is cardiac specific and write its pattern of rise in patients with myocardial infarction. (1+2+1+2)  
1+1+1+2

## SHORT ANSWERS

10 x 3 = 30 Marks

13. Explain the rationale behind using glycated hemoglobin (HbA1c) as an indicator of glycemic control in diabetes mellitus. What is the reference range for HbA1c
14. Deficiency of lung surfactant causes Respiratory Distress Syndrome.
- What is the composition of lung surfactant? (1)
  - What is the biochemical basis for Respiratory distress syndrome? (1)
  - What is the significance of L/S ratio (1)
15. Explain the structure of collagen. (5) 3
16. What is the coenzyme form of pyridoxine? Write two pyridoxine dependent reactions. (1+2)
17. Mutual supplementation of cereals and pulses is beneficial. Justify. (3)
18. Give reason for the following:
- Requirement of Thiamine is increased in Alcoholics (2)
  - Prescription of folic acid during early pregnancy (1)
19. Name the most effective physiological buffer in the plasma. Explain the role of carbonic anhydrase in acid base homeostasis. (1+2)
20. Barbiturates should be given with caution in chronic alcoholics. Justify (3)
21. List routinely measured serum electrolytes. Mention their reference range. (1+2)
22. Write the type of inhibitions seen in the following :
- Inhibition of Vitamin K by Dicoumarol - an anticoagulant (1)
  - Inhibition of Cyclo-oxygenase by Aspirin. (1)
  - Inhibition of Placental Alkaline Phosphatase by Phenylalanine. (1)

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**Rajiv Gandhi University of Health Sciences, Karnataka**  
**MBBS Phase – I (CBME) Degree Examination - 19-Feb-2021**

**Time: Three Hours**

**Max. Marks: 100 Marks**

**BIOCHEMISTRY – PAPER II (RS-4)**

**Q.P. CODE: 1025**

**(QP contains two pages)**

Your answers should be specific to the questions asked.  
Draw neat, labeled diagrams wherever necessary.

**LONG ESSAYS**

**2 x 10 = 20 Marks**

1. A 5 year old boy was brought to a Pediatrician with history of mousy odour of urine and delay in achieving cognitive functions. On examination, the boy's skin and hair was fair in colour with hypopigmentation.
  - a. What is the probable diagnosis? (1)
  - b. Name the enzyme defect in the above disorder. (1)
  - c. Write the pathway for catabolism of the above amino acid (5)
  - d. Mention the reason for the cause of mousy odour in urine (1)
  - e. What biochemical tests are done to confirm the diagnosis? (2)
2. Describe the steps of transcription in prokaryotes. Mention the inhibitors of transcription. (6+1+3)

**SHORT ESSAYS**

**10 x 5 = 50 Marks**

3. A 8 year old girl from endemic malaria area who had splenomegaly was investigated for routine hematology, which revealed low hemoglobin of 7 gm%. Peripheral smear revealed crescent shaped RBCs. She had no history of malaria attack.
  - a. What could be the molecular defect of hemoglobin in the above case? (2)
  - b. Name the biochemical investigations which can be done to confirm the diagnosis. (2)
  - c. Reason out why these patients show resistance to malaria. (1)
4. Interpret the following Liver Function Test report:

Total Bilirubin	Direct bilirubin	Alkaline phosphatase	Ehrlich's test	Stool sample
7.7 mg/dl	3.6 mg/dl	265 IU/L	Negative	Clay colour

- a. What is the probable diagnosis? (1)
  - b. Mention the possible causes for the above condition? (2)
  - c. Substantiate with reasons for increase in conjugated fraction of bilirubin. (2)
5. Explain the steps in Polymerase Chain Reaction (PCR). Mention four applications of PCR. (3+2)
  6. Mention five tumor markers with their diagnostic importance.
  7. Explain the disorders associated with purine synthesis and breakdown.
  8. Describe the steps involved in heme degradation.
  9. List the renal function tests. Explain the principle and application of creatinine clearance. (2 +3)

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- 10 Explain structure and function relationship of protein with an example.
- 11 Explain the role of antioxidants in protection against reactive oxygen species (ROS).
- 12 Explain the immunological basis of vaccine development.

## SHORT ANSWERS

10 x 3 = 30 Marks

13. Explain the process of activation of proto-oncogenes to oncogenes.
14. Write the process of phase I detoxification with one example.
15. Name the polyamines and mention their clinical significance.
16. State the advantages of automation in clinical biochemistry laboratory.
17. Draw a neat labelled diagram of structure of t-RNA.
18. Mention the sources of carbon and nitrogen atoms of pyrimidine bases.
19. Mention the normal Albumin/Globulin (A/G) ratio. Give two disorders associated with altered A/G ratio. (1+2)
20. Write the characteristics of genetic code.
21. Compare and contrast between nucleosides and nucleotides.
22. What are molecular scissors? Mention its applications. (1+2)

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