

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore
Pharmacology - II
III year Pharm. D

Sl No	Chapter Name	Long Essay	Short Essay	Short Answer	Total Marks	Duration allotted
1	Pharmacology of Drugs acting on Blood and blood forming agents	-	01	01	07	05

SHORT ESSAYS:

1. Classify anticoagulants with examples. Mention in-vitro anticoagulants.
2. Compare the pharmacology of heparin and warfarin.
3. What is heparin? Write its mechanism of action and therapeutic uses.
4. Write mechanism of action, adverse effects and therapeutic uses of warfarin.
5. Write mechanism of action, advantages and uses of Low Molecular Weight Heparins.
6. What are thrombolytics? Give examples. Write their mechanism of action and therapeutic uses.
7. Classify antiplatelet agents on the basis of mechanism of action with examples.
8. What are GP IIb/IIIa antagonists? Give examples. Write their mechanism of action and uses.
9. Write mechanism of action and uses of aspirin and clopidogrel combination.
10. Write mechanism of action and uses of aspirin and dipyridamole combination.
11. Enlist antiplatelet agents? Write the mechanism of action and therapeutic uses of aspirin as an antiplatelet agent.
12. Write sources, mechanism of action and therapeutic uses streptokinase and urokinase.
13. How do you treat iron deficiency anaemia? Explain with examples.
14. What are recombinant tissue plasminogen activators? Write their mechanism of action and uses.
15. Write briefly on different classes of agents used for the treatment of anaemia.

SHORT ANSWERS:

1. Mention any four low molecular weight heparins.
2. Mention antagonists for heparin and warfarin along with their uses.
3. Write four therapeutic uses of anticoagulants.
4. Mention two common adverse effects and two contraindications of anticoagulants.
5. Mention four oral anticoagulants.
6. What are Low Molecular Weight Heparins? Give two examples.
7. Write significance of GP IIb/IIIa antagonists and give two examples.
8. Write mechanism of antiplatelet action of aspirin.
9. Write any four prophylactic uses of clopidogrel.
10. Write mechanism of action of thrombolytic agents.
11. Name four fibrinolytic agents.
12. What are plasma expanders? Give two examples.
13. Name two plasma expanders. Mention their uses.
14. What is megaloblastic anaemia? Mention two drugs used in its treatment.
15. What is microcytic hypochromic anaemia? Mention two drugs used in its treatment.
16. What are haematopoietic growth factors? Give two examples.
17. Mention four parenteral iron preparations.
18. Write indications for parenteral iron preparations.

Sl No	Chapter Name	Long Essay	Short Essay	Short Answer	Total Marks	Duration allotted
2	Pharmacology of drugs acting on Renal System	-	01	01	07	04

SHORT ESSAYS

1. What are diuretics? Classify them with examples.
2. Write mechanism of action, adverse effects and uses of loop diuretics.
3. Define diuretic? Write the clinical application of diuretics with emphasis on edema.
4. Write mechanism of action, adverse effects and uses of thiazide diuretics.
5. Enlist potassium sparing diuretics. Write their mechanism of action and uses.
6. Classify weak diuretics. Add a note on mechanism of action and uses of Carbonic anhydrase inhibitors.
7. Enlist diuretics acting on ascending and descending loop of Henle. Write their adverse effects and therapeutic uses.
8. What are anti-diuretics? Give examples. Add a note on mechanism of action and uses of ADH.
9. Write the mechanism action, adverse effect of uses of frusemide.
10. Write the pharmacology action of spiranolactone.

SHORT ANSWERS

1. Name four vasopressin analogues?
2. Name any two ADH and its two uses.
3. Define carbonic anhydrase inhibitors? Give two examples.
4. What are osmotic diuretics? Write their uses.
5. Classify diuretics showing their site of action in nephron.
6. Write four uses of potassium sparing diuretics.
7. Enlist potassium sparing diuretics.
8. Mention four uses of thiazide diuretics.
9. Give four indications for loop diuretics.
10. Mention four adverse effects of diuretics.

Sl No	Chapter Name	Long Essay	Short Essay	Short Answer	Total Marks	Duration allotted
3	CHEMOTHERAPY	01	02	02	24	31 hrs

LONG ESSAYS:

01. Classify sulfonamides with examples. Write the mechanism of action, merits and uses of co-trimoxazole. (4+2+2+2)
02. Classify penicillins with examples. Write the mechanism of action and therapeutic uses of amoxicillin. (4+3+3)
03. What are penicillins? Write antimicrobial spectrum, adverse effects, preparations and uses of natural penicillins. (2+2+2+2+2)
04. Classify cephalosporin with examples. Highlight on changes in antimicrobial spectrum, adverse reactions and therapeutic uses of each generation of cephalosporin. (4+6)
05. Compare and contrast different generations of tetracyclins with example. Discuss about their mechanism of action and antimicrobial spectrum.
06. Explain mechanism of action of antimicrobial agents acting by inhibiting protein synthesis (2.5×4)
07. Write in detail about classification of anti-bacterial agents depending on mechanism of action with examples. (2+2+2+2+2)
08. What are macrolide antibiotics? Give examples. Write the antimicrobial spectrum, mechanism of action and therapeutic uses of erythromycin/azithromycin/clarithromycin. (2+2+2+2+2)
09. What are aminoglycoside antibiotics? Write the mechanism of action, adverse reactions and therapeutic uses of streptomycin/amikacin. (2+3+3+2)
10. Write the antifungal spectrum, mechanism of action, adverse reactions and therapeutic uses of amphotericin B. (2.5×4)
11. Classify antifungal agents with examples. Write mechanism of action, adverse reactions and therapeutic uses of fluconazole and itraconazole. (3+3+2+2)
12. Classify antiviral agents with examples. Write the mechanism of action, adverse reactions and therapeutic uses of acyclovir. (4+2+2+2)
13. What is DOTS? Classify anti TB drugs with examples. Write the mechanism of action, adverse effects of INH. (2+3+3+2)
14. Write the mechanism of action, adverse effects and therapeutic effects of rifampicin, pyrazinamide, Ethambutol. (4+3+3)
15. Classify anti-leprotic drugs with examples. Write the mechanism of action, adverse effects and therapeutic uses of dapsone. Add note on different forms of leprosy. (3+4+3)
16. Classify antimalarials with examples. Write the mechanism of action, adverse effects and therapeutic uses of chloroquine. (4+6)
17. Name the causative organisms of malaria. Classify antimalarials on the basis of stage of action. Write the mechanism of action, adverse effects and therapeutic effects of artemisinin. (2+3+5)
18. Write life cycle of amoebic parasite. Write the mechanism of action, adverse effects, and therapeutic uses of tinidazole. (4+6)
19. Classify antineoplastic agents with examples. Write the mechanism of action and adverse effects of alkylating agents. (5+5)
20. What is cancer? Explain the basic principle involved in the treatment of cancer. Write the mechanism of action therapeutic uses of an antimetabolite. (1+4+5)

1. Write about mode of antimicrobial resistance in microbes.
2. Suggest measures to prevent superinfection and microbial resistance.
3. Write the antimicrobial spectrum and mechanism of action of a true broad spectrum antibiotic.
4. Write the mechanism of action and uses of ampicillin.
5. Explain rationale behind co-trimazole combination. Write its advantages and uses.
6. Classify cephalosporins with examples and mention the therapeutic uses.
7. Write antimicrobial spectrum, mechanism of action and adverse effects of fluoroquinolones.
8. Name four triazole anti-fungal agents? Write their merits and mechanism of action.
9. Write the pharmacology of drugs used in the treatment of giardiasis.
10. Classify helminthes and anthelmintics with examples.
11. Write the mechanism of action, adverse effects and uses of albendazole.
12. Differentiate between paucibacillary and multibacillary leprosy. Add a note on their treatment.
13. Classify the anticancer agents with examples.
14. Give cell cycle based classification of anticancer drugs.
15. Write the pharmacology of taxols.
16. Write the mechanism of action, adverse effects and uses of vincristine.
17. Write the mechanism of action, adverse effects and uses of methotrexate.
18. Write the mechanism of action, adverse effects and uses of 5-fluorouracil.
19. Write the mechanism of action, adverse effects and uses of mercaptopurine.
20. Outline life cycle of plasmodium three species.
21. Write briefly on therapeutic classification of antimalarial agents.
22. Classify anti-retroviral agents with examples? Mention their important adverse effects.
23. Enlist aminoglycoside antibiotics and write their adverse effects.
24. Write about common features of aminoglycosides and write therapeutic uses of gentamicin.
25. Classify fluoroquinolones with examples and write their therapeutic uses.
26. Describe the adverse effects of anti-neoplastic agents.

SHORT ANSWERS:

1. What is superinfection?
2. What is multidrug therapy? Give example.
3. What is grey baby syndrome?
4. Enlist the drugs causing ototoxicity?
5. Enlist the drugs causing nephrotoxicity?
6. What is anaphylaxis?
7. What are the drugs used in treatment of tapeworm infection?
8. What are the drugs used in treatment of round worm infection?
9. What are the drugs used in filariasis?
10. Which are the causative organisms of filariasis?
11. What is amoebiasis? Name two drugs used in the treatment of amoebiasis?
12. Enlist the four uses of tetracyclines/doxycycline/oxytetracycline
13. Enlist the four toxic effects of chloramphenicol.
14. Name the causative organisms of malaria.
15. Name the opportunistic infections in HIV.
16. What is multidrug regimen for the treatment of TB and name the drugs.
17. What is DOTS therapy?
18. Mention β -lactamase inhibitors. Mention their use.
19. Mention any four blood schizonticides.
20. What is chemoprophylaxis? Give examples.

21. Write uses of griseofulvin.
22. Mention DHFR inhibitors. Write their uses.
23. What are probiotics? Give examples.
24. What is crystaluria? How can it be prevented?
25. Mention four adverse effects of anti-cancer drugs.

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Sl No	Chapter Name	Long Essay	Short Essay	Short Answer	Total Marks	Duration allotted
4	Immunopharmacology	-	-	02	04	03hrs

SHORT ANSWERS

1. Enlist four immunostimulants.
2. Write uses of immunostimulants.
3. What are Colony-Stimulating Factors? Write their specific use.
4. What are Interferons? Give examples.
5. Write indications for recombinant interferons.
6. What is Levamisole? Write its uses.
7. Outline mechanism of action of Cyclosporin.
8. Mention calcineurin inhibitors. Write their uses.
9. What are cytotoxic agents? Write their significance in immunology.
10. Write briefly on immunosuppressant actions of Glucocorticoids.
11. Write uses of Glucocorticoids as immunosuppressants.
12. Write uses of Tacrolimus.
13. Mention immunosuppressant monoclonal antibodies.
14. Enlist cytokine inhibitors.
15. How does cyclophosphamide produce immunosuppression?
16. Define immunostimulant and immunosuppressant with two examples.
17. What is Thymosin? Mention its therapeutic uses.
18. What are mTOR inhibitors? Give examples.
19. What are *TNF* – α inhibitors? Give examples.
20. What are Interleukins? Mention their inhibitors.

Sl No	Chapter Name	Long Essay	Short Essay	Short Answer	Total Marks	Duration allotted
5	Principles of Animal toxicology	-	-	01	02	02hrs

SHORT ANSWERS

1. Define toxicology.
2. What is OECD 420 guidelines? Write its significance in toxicity studies.
3. Explain the term acute toxicity.
4. Explain the term subacute toxicity.
5. Explain the term chronic toxicity.
6. What four objective of special toxicity?
7. Define therapeutic index.
8. What is difference between acute and chronic toxicity studies with examples.
9. Mention OECD guidelines used for determination LD₅₀.
10. Write about duration of study period for acute, subacute and chronic toxicity studies.

Sl No	Chapter Name	Long Essay	Short Essay	Short Answer	Total Marks	Duration allotted
6	The dynamic cell: The structures and functions of the components of the cell	-	01	02	09	11hrs

SHORT ESSAY

1. Write cellular classification along with brief description.
2. Write significance of different macromolecular assemblies of cell.
3. What is chromosome? Explain the structural aspects of the chromosome in eukaryotes.
4. Draw cell cycle and give brief note on events of each phase.
5. Explain the process of cell cycle regulation.
6. Describe the term Genome complexity.
7. Explain the stages of interphase.
8. Describe the signal transduction pathway of MAPK kinases.
9. Describe the signal transduction pathway of p38 kinases pathway.
10. Describe the signal transduction pathway of P13 kinases pathway.
11. Describe the signal transduction pathway JNK kinases pathway.
12. Explain salient features of B-form of DNA with a neat labeled diagram.
13. Distinguish between the processes of DNA replication in prokaryotes and eukaryotes.
14. Write a note on steps involved in eukaryotic DNA replication.
15. Write a note on steps involved in prokaryotic DNA replication.
16. When does the tumor suppressive factor activated? How does it act?
17. What are biosensors? Write their general mode of action and uses
18. Write a note on modes of cell communication.
19. Discuss about the results of cell communication.
20. Write briefly on cell signal transduction mechanisms.

1. Mention the cell signal transduction pathways.
2. Name the methods of communication between the cells.
3. Name the subcellular organelles.
4. What are cytokines?
5. What is prometaphase?
6. Enlist the cell cycle checkpoints.
7. What is anaphase?
8. What is zygotene?
9. What is telophase?
10. What is diplotene?
11. What is diakinesis?
12. Differentiate between Eukaryotic and Prokaryotic chromosome.
13. Name cell cycle regulators and modifiers.
14. What are Biosensors?
15. Outline the principle of biosensors.
16. Write qualities of an ideal biosensor.
17. Differentiate between DNA and RNA.
18. Define genome.
19. Draw a diagram of cell cycle.
20. Write the chromatin structure.
21. Write four applications of biosensors.
22. Mention the contributions of P38 in cellular processes.
23. Give reasons for activation of P53 factor.
24. Mention stages of mitosis.
25. What is karyokinesis and cytokinesis?

Sl No	Chapter Name	Long Essay	Short Essay	Short Answer	Total Marks	Duration allotted
7.	The dynamic cell: The gene	01	01	01	09	19hrs

LONG ESSAYS

- Describe the steps involved in recombinant DNA technology. Add a note on their pharmaceutical applications. (7+3)
- Explain the stages of transcription in prokaryotes and add a note on factors regulating the transcription. (6+4)
- Outline the steps involved in the process of gene expression in prokaryotes. (5+5)
- Describe the steps involved in transcription and translation processes of eukaryotes. (5+5)
- Differentiate between gene sequencing and mapping. Describe any two methods of gene sequencing. (7+3)
- Explain the processes and applications of gene transfer technology. (6+4)
- What is gene expression? Write in detail about regulation of transcription and translation in eukaryotes. (2+4+4)
- Explain the basic principles and procedures of gene therapy. (3+7)
- Discuss about the strategies, limitations and applications of gene therapy. (4+3+3)
- Describe the process of protein synthesis in eukaryotes.

SHORT ESSAYS

- Describe structure of gene with a labelled diagram.
- Explain the steps involved in transcription process of prokaryotes.
- What is gene therapy? Write applications of gene therapy.
- Explain the steps involved in translation process of prokaryotes.
- Explain any two methods of gene sequencing.
- Write about limitations and applications of gene therapy
- Describe viral and non-viral approaches of gene therapy.
- Describe the structure of mRNA with schematic diagram.
- Describe the structure of tRNA with schematic diagram.
- Explain any four strategies for correcting defective gene.
- Differentiate between prokaryotic and eukaryotic genes.
- Write a note on regulation of gene expression in eukaryotes.
- Explain the process of positive and negative regulation of Lac Operon.
- Write briefly about enzymes used in recombinant DNA technology.
- How do you obtain desired gene in recombinant DNA technology?
- Mention techniques used for identification of recombinant cells. Explain any one.
- Write a flow chart showing the steps involved in recombinant DNA technology.
- What is RNA processing? Write the importance of rRNA, tRNA and mRNA?
- What is mutation? Add a note on types of mutations.

SHORT ANSWERS

1. Name the components of gene.
2. Write difference between gene mapping and sequencing.
3. Mention any four methods of DNA sequencing.
4. What are OKAZAKI fragments?
5. What are leading and lagging strands.
6. Name the components of promoter sequence.
7. Write the significance of sense and nonsense strands in DNA.
8. What is Chargorff 's rule?
9. What are oncogenes? Give examples.
10. Write the significance of repetitive and non repetitive sequences in a gene.
11. What is gene mapping?
12. What is mutation?
13. What is meant by Genome and Genomics?
14. Name the Termination codons and Initiation codons.
15. What are the applications of human genome sequencing?
16. Name the types of gene therapies?
17. Types of Mutations with examples?
18. What is amplification?
19. What is LOH?
20. Explain the functioning of tumour suppressor genes?
21. Name four diseases caused due to mutations?
22. Name post-translation events in protein synthesis?
23. What is tRNA? Write its role.
24. Write four application of recombinant-DNA technology?
25. Name the events in eukaryotic protein synthesis?