Written

1. *Mention MOA and uses of vit D ?*
2. *Mention MOA , uses , side effect of raloxifene ?*
3. *As regard bisphosphonate mention MOA , uses , SE ?*
4. *Mention MOA of teriparatide in low intermitant doses ?*
5. *Enumerate line of treatment of osteoporosis ? or enumerate two drugs used to treat osteoporosis and their mechanism of action ?*
6. *Enumerate lines of treatment of hypercalcemia ?*

7. ***Cases scenario :***

A healthy 50-year-old woman has recently entered menopause. She returned to her physician because her mother had osteoporosis and fractured her hip, she asks about preventive therapy. She has been taking an adequate amount of calcium and has increased her intake of vitamin D. Her physician arranges for a bone mineral density (BMD) test, which reveals that her BMD T-score is -2 (normal is greater than -1). Based on her T-score and family history of osteoporosis, her physician suggests that she begin therapy with Alendronate.

- ***How can alendronate reduce the risk of osteoporosis?***
  - ✓ *Inhibit osteoclastic activity and survival → ↓ bone resorption*

- ***What are its side effects?***
  1. *Gastric & esophageal irritation*
  2. *Renal impairments*
  3. *Osteonecrosis of the jaw*

MCQ

1. The following is recombinant PTH used in treatment of osteoporosis? *a) Estrogen* *b) Bisphosphonates* *c) Raloxifene* *d) Prednisolone* *e) Teriparatide*	***E***
2. Vitamin D is used in treatment of which of the following conditions? *a) Gout* *b) Osteoporosis* *c) Post operative pain.* *d) Hypercalcemia* *e) Rheumatic fever*	***B***
3. Indication for 1,25-dihydroxyvitamin D3 (calcitriol) administration is: *A. Vitamin D resistance* *B. Elevated skeletal turnover* *C. Hypercalcemia of malignancy* *D. Hypophosphatemia* *E. Primary hyperparathyroidism*	***D***
4. Indication for risidronate or alendronate administration is: *A. Failure of vitamin D formation in skin* *B. Hypoparathyroidism* *C. Elevated skeletal turnover* *D. Hypophosphatemia* *E. Metastatic bone disease*	***E***

5. Correct statements about fluoride include all of the following, EXCEPT: *A. Fluoride is effective for the prophylaxis of dental caries* *B. Fluoride is accumulated by bone and teeth, where it may stabilize the hydroxyapatite crystal* *C. Subjects living in areas with naturally fluoridated water (1-2 ppm) had more dental caries and fewer vertebral compression fractures than subjects living in non fluoridated water areas* *D. Chronic exposure to very high level of fluoride results in thickening of the cortex of long bones and bony exostoses.*	**C**
6. Which one of the following is most likely to be useful in the therapy of hypercalcemia? *A. Calcitonin* *B. Glucocorticoids* *C. 1-25 dihydroxy vitamin D3* *D. Parenteral infusion of phosphate* *E. Thiazide diuretics*	***B***
7. Which of the following drugs can cause rickets in children by increasing Vitamin D metabolism? *A. Tetracycline* *B. Phenylbutazone* *C. Phenytoin* *D. Ciprofloxacin* *E. Ibuprofen*	**C**
8. Bone resorption is accelerated by: *A. Estrogens* *B. Fluorides* *C. Parathormone* *D. Bisphosphonates* *E. Calcitonin*	**C**

9. Osteonecrosis of the jaw may be an adverse effect of: *A. Estrogens* *B. Fluorides* *C. Parathormone* *D. Bisphosphonates* *E. Calcitonin*	***D***
10. ***A 34-year-old woman with ulcerative colitis has required long- term treatment with pharmacologic doses of a glucocorticoid agonist. Which of the following is a toxic effect associated with long-term glucocorticoid treatment?*** *A. A lupus-like syndrome* *B. Adrenal gland neoplasm* *C. Hepatotoxicity* *D. Osteoporosis* *E. Precocious puberty in children*	***D***
11. ***The active metabolites of vitamin D act through a nuclear receptor to produce which of the following effects?*** *A. Decrease the absorption of calcium from bone* *B. Increase PTH formation* *C. Increase renal production of erythropoietin* *D. Increase the absorption of calcium from the GIT* *E. Lower the serum phosphate concentration*	***D***
12. Indication for risidronate or alendronate administration is: *A. Failure of vitamin D formation in skin* *B. Hypoparathyroidism* *C. Elevated skeletal turnover* *D. Hypophosphatemia* *E. metastatic bone dse*	***E***

13. The patient began therapy with a nasal spray containing a protein that inhibits bone resorption. The drug contained in the nasal spray was which of the following? *A. Calcitonin* *B. Calcitriol* *C. Cinacalcet* *D. Cortisol* *E. Teriparatide*	***A***
14. One of the following is the drug of choice for management of glucocorticoid-induced osteoporosis: *a) Alendronate* *b) Calcitonin* *c) Estrogen* *d) Ketoconazole* *e) Vitamin D*	***A***
15. Which of the following is a unique property of SERMS? *(A) Act as agonists in some tissues and antagonists in other tissues* *(B) Activate a unique plasma membrane-bound receptor* *(C) Have both estrogenic and progestational agonist activity* *(D) Inhibit the aromatase enzyme required for estrogen synthesis* *(E) Produce estrogenic effects without binding to estrogen receptors*	***A***
16. All of the following drugs could be used for treatment of senile osteoporosis EXCEPT: *a. Vitamin D.* *b. Calcitonin.* *c. Bisphosphonates.* *d. Estrogen.* *e. Corticosteroids.*	***E***

17. The patient's condition was not sufficiently controlled with alendronate, so she began therapy with a nasal spray containing a protein that inhibits bone resorption. The drug contained in the nasal spray was which of the following? *(A) Calcitonin* *(B) Calcitriol* *(C) Cinacalcet* *(D) Cortisol* *(E) Teriparatide*	***A***
18. A 66-year-old woman with osteoporosis is prescribed alendronate. What is the mechanism of action of alendronate sodium? *A. Inhibition of osteoclastic activity in bone* *B. Increases reabsorption of Ca2 and Mg2* *C. Increases production of calcitriol and dihydrotachysterol* *D. Decreases reabsorption of phosphate, bicarbonate, amino acids, sulfate, sodium, and chloride*	***A***
19. Which of the following conditions is an indication for the use of raloxifene? *a- Chronic renal failure* *b- Hypoparathyroidism* *c- Intestinal Osteodystrophy* *d- Postmenopausal Osteoporosis*	***D***
20. A drug that decreases serum calcium level, used in osteoporosis & hypercalcemia: *A. Calcitonin.* *B. Estrogen.* *C. Parathyroid hormone.* *D. Prednisone.*	***A***

21. The following is NOT true concerning bisphosphonates: *A. Decreases bone turnover in Paget's disease of bone.* *B. Alendronate Inhibits an enzyme necessary for osteoclasts survival.* *C. Esophagitis is the most serious adverse effect & is reduced if taken with a full glass of water while sitting upright.* *D. May be safely given in renal dysfunction.*	***D***
22. Calcitonin is a hormone that: *a) Increases calcium levels in the blood* *b) Decreases calcium levels in the blood* *c) Blocks the entry of calcium into cells* *d) Promotes the release of calcium from the bone*	***B***
23. Vitamin D supplements are often prescribed to: *a) Increase calcium absorption from the intestines* *b) Inhibit the release of calcium from the bone* *c) Block the entry of calcium into cells* *d) Decrease calcium levels in the body*	***A***
24. Bisphosphonates work by: *a) Increasing calcium absorption from the intestines* *b) Inhibiting the breakdown of bone* *c) Promoting the release of calcium from the bones* *d) Blocking the entry of calcium into cells*	***B***
25. Which of the following is a common side effect of bisphosphonate use? *a) Hypocalcemia* *b) Hypercalcemia* *c) Osteomalacia* *d) Esophageal irritation*	***D***

26. Bisphosphonates are contraindicated in patients with: *a) Hypocalcemia* *b) Hypercalcemia* *c) Renal impairment* *d) Allergies to dairy products*	***C***
27. Which of the following is an example of a bisphosphonate drug? *a) Alendronate* *b) Metoprolol* *c) Insulin glargine* *d) Salbutamol*	***A***
28. Bisphosphonates are classified as: *a) Antibiotics* *b) Antacids* *c) Anticoagulants* *d) Antiresorptive agents*	***D***
29. Denosumab is classified as a: *a) Bisphosphonate* *b) Selective estrogen receptor modulator* *c) Monoclonal antibody* *d) Calcium channel blocker*	***C***
30. Denosumab is used as a treatment option for secondary prevention of fractures in patients with: *a) Rheumatoid arthritis* *b) Hypertension* *c) Multiple sclerosis* *d) Breast cancer*	***D***

31. Denosumab works by: *a) Increasing calcium absorption in the intestines* *b) Stimulating bone formation* *c) Inhibiting bone resorption* *d) Promoting the release of parathyroid hormone*	**C**
32. Teriparatide is classified as a: *a) Bisphosphonate* *b) Selective estrogen receptor modulator* *c) Monoclonal antibody* *d) Parathyroid hormone analog*	**D**
33. Calcitonin is used in treatment of: *A. hyperaldosteronism* *B. hyperthyroidism* *C. hypercalcaemia* *D. hyperkalaemia* *E. hyperuricaemia*	**C**
34. The following statements about the parathyroid hormone are true, EXCEPT: *a) The parathyroid hormone (PTH) is a single-chain peptide hormone composed of 84 amino acids* *b) The parathyroid hormone increases calcium and phosphate absorption in intestine (by increased 1,25-dihydroxyvitamin D3 production)* *c) The parathyroid hormone increases serum calcium and decreases serum phosphate* *d) The parathyroid hormone increases calcium excretion and decreases phosphate excretion in kidneys*	**D**

35. Denosumab, a monoclonal antibody against rank ligand is used for the treatment of: *(a) Rheumatoid arthritis* *(b) Osteoporosis* *(c) Osteoarthritis* *(d) Systemic lupus erythematosis*	***B***
36. Bisphosphonates act by: *(a) Increasing osteoid formation* *(b) Increasing mineralization of osteoid* *(c) Decreasing osteoclast mediated resorption of bone* *(d) Decreasing PTH secretion*	***C***
37. rPTH used in osteoporosis is: *a. Teriparatide* *b. Denosumab* *c. Calcitriol* *d. Calciportiola*	***A***
38. What advice would you give to a patient who is to be treated with bisphosphonates? *مش مكتوبه بس اعرفها كمعلومه* *a. Take the drug before meals with a full glass of water* *b. Take the drug after meals with a full glass of water* *c. Discontinue the drug if bone pain persists* *d. Discontinue the drug if gastric irritation persists*	***A***
39. Which of the following drug is a SERM useful for treatment of osteoporosis? *a. Raloxifene* *b. Bisphophonate* *c. Strontium* *d. Estradiol*	***A***

40. Which one of the following is most likely to be useful in the therapy of hypercalcemia? *A. Calcitonin* *B. Glucocorticoids* *C. 1-25 dihydroxy vitamin D3* *D. Parenteral infusion of phosphate* *E. Thiazide diuretics*	***B***
41. What is the first-line treatment for symptomatic hypercalcemia? *A) Oral bisphosphonates* *B) Intravenous fluids (normal saline)* *C) Calcitonin* *D) Corticosteroids*	***B***
42. What is the mechanism of action of denosumab in the treatment of hypercalcemia? *A) Inhibits parathyroid hormone secretion* *B) Blocks RANKL, reducing osteoclast activity* *C) Increases renal calcium reabsorption* *D) Enhances intestinal calcium absorption*	***B***
43. What is the mechanism of action of cinacalcet? *A. It inhibits calcium absorption in the intestines.* *B. It acts as a calcimimetic, increasing the sensitivity of calcium-sensing receptors in the parathyroid gland.* *C. It blocks the action of parathyroid hormone.* *D. It stimulates calcitonin release.*	***B***

44. What is the mechanism by which sodium fluoride exerts its cariostatic effect? *A) Reducing the acidity of saliva* *B) Enhancing calcium absorption* *C) Inhibiting bacterial metabolism* *D) Facilitating the deposition of calcium and phosphate in enamel*	***D***