

Assessment of your knowledge

(a) Answer the following questions to assess your command on terminology, facts, concepts, and theories learned in this chapter:

1. What type of collagen is predominantly found in hyaline cartilage?
2. What is the most abundant proteoglycan found in cartilage?
3. Which cells is responsible for cartilage matrix synthesis?
4. What happens to chondrocytes when they are cultured in 2D monolayer cultures?
5. From which anatomical locations can chondrocytes be isolated?
6. Which technique is recommended by NICE for the repair of chondral defects over 2 cm²?
7. What is the minimum chondrocyte seeding density required to start chondrogenesis in a scaffold?
8. Name three functions of bone.
9. What is located between the epiphysis and the diaphysis? What cell serves as a mechanoreceptor in bone?
10. What cell degrades bone matrix?
11. What is the main type of collagen in bone?
12. Name an osteoinductive growth factor.
13. What predominantly forms the mineral phase of bone?
14. Name types of fracture healing.
15. Name two types of bone formation.
16. Is woven bone anisotropic or isotropic?
17. Name types of bone graft derived from humans.
18. Define a critical size defect.
19. Name types of material used in synthetic bone graft products.

(b) Answer the following questions to assess your ability to apply the concepts and theories learned in this chapter in real life, clinical, and scientific situations:

1. Describe the structure of articular cartilage and explain how it functions as a shock absorber in the joints.
2. Describe the autologous chondrocyte implantation technique, list the NICE guidelines for its use and the limitations of this technique.
3. Describe the structure of bone.
4. Describe the process of fracture repair.
5. Describe the isolation and characterization of skeletal stem cells.
6. Discuss the use of scaffolds in bone regeneration.
7. Discuss the function of the vasculature in skeletal regeneration.
8. Characterize the properties of bone graft material.
9. Describe the materials from which synthetic bone graft products are derived.
10. Compare and contrast the likely bone graft requirements in fixation of a scaphoid nonunion and a tibial plateau fracture.