3. (a) Using a suitable example, explain how priority is assigned to processes in the Rate Monotonic Algorithm (RMA). [5]

(b) Explain when a page fault occurs and how such a fault is handled. [5]

(c) Compare and contrast the following two memory problems: *internal fragmentation* and *external* fragmentation. [5]

(d) Explain the *best fit* and *first fit* algorithms for memory allocation. [5]

(e) The following list describes holes currently available in memory, together with their respective sizes:

$$\langle (B_1, 20), (B_2, 30), (B_3, 25), (B_4, 10), (B_5, 20), (B_6, 15) \rangle$$

The kernel keeps track of the memory requests of different processes, as follows:

$$\langle (P_1, 22), (P_2, 17), (P_3, 3), (P_4, 10), (P_5, 8), (P_6, 17) \rangle$$

(i) Calculate the size of the holes left when the *first fit* algorithm is used for memory allocation. Justify your answer. [3]

(ii) Show the memory allocation for each process when the *worst fit* algorithm is used. [2]