UNIVERSITI
TEKNOLOGI
PETRONAS

FINAL EXAMINATION
JANUARY 2017 SEMESTER

COURSE : **VDB4233 / VCB4233 – COASTAL PLANNING AND MANAGEMENT**

DATE : **29 APRIL 2017 (SATURDY)**

TIME : **9.00 AM – 12.00 NOON (3 HOURS)**

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** questions in the Answer Booklet.
2. Begin **EACH** answer on a new page.
3. Indicate clearly answers that are cancelled, if any.
4. Where applicable, show clearly steps taken in arriving at the solutions and indicate **ALL** assumptions.
5. Do not open this Question Booklet until instructed.

Note : There are **SIX (6)** pages in this Question Booklet including the cover page.

1. **FIGURE Q1** shows part of the innovative pile-row breakwaters which have been implemented to mitigate serious coastal erosion problem at a popular beach resort in Langkawi. The pile row was 120 m long and constructed using 350 mm concrete spun piles with an intermediate spacing of 70 mm between piles. The piles were placed approximately 75 m seawards, almost around the Mean Low Water Spring line. The crest of the piles was set about 0.2 m above the Mean High Water Spring. The eroded beach had fully recovered two years after the project implementation. The sand build-up had reached up to the pile row, which was more than the anticipated salient.

   a. Justify the design rationale for the 70 mm intermediate spacing in between the piles.

   [10 marks]

   b. Propose and elaborate **TWO (2)** possible enhancements that could be applied to further optimize the results of the implementation.

   [10 marks]

FIGURE Q1

2. a. **FIGURE Q2** shows an abandoned marina near Kuala Kedah due to severe sedimentation within the basin.

i. Appraise the sedimentation problem in the marina and argue whether re-dredging of the marina basin is a possible sustainable solution.

[4 marks]

ii. Propose and elaborate **TWO (2)** important criteria that should be considered in future planning of similar projects so as to avoid the sedimentation problem. Provide a sketch with labels to illustrate.

[10 marks]

FIGURE Q2

b. Beach nourishment is considered to be one of the soft measures for eroding coastline. Propose **TWO (2)** possible reasons why beach nourishment apparently not a popular choice in some cases.

[6 marks]

3. a. A 23 km long bridge project is to be constructed connecting a mainland with the Big Island as shown in **FIGURE Q3**. The bridge will be constructed on piers of 1.5 m diameter. The area around the proposed middle span is covered by mud flats and has shallow water depth. The bed level of the area is around 0 m ACD. Part of the construction works will require dredging to provide assess for the construction plants including piling barges. Appraise and elaborate **TWO (2)** potential impacts from the construction of the proposed project.

[10 marks]

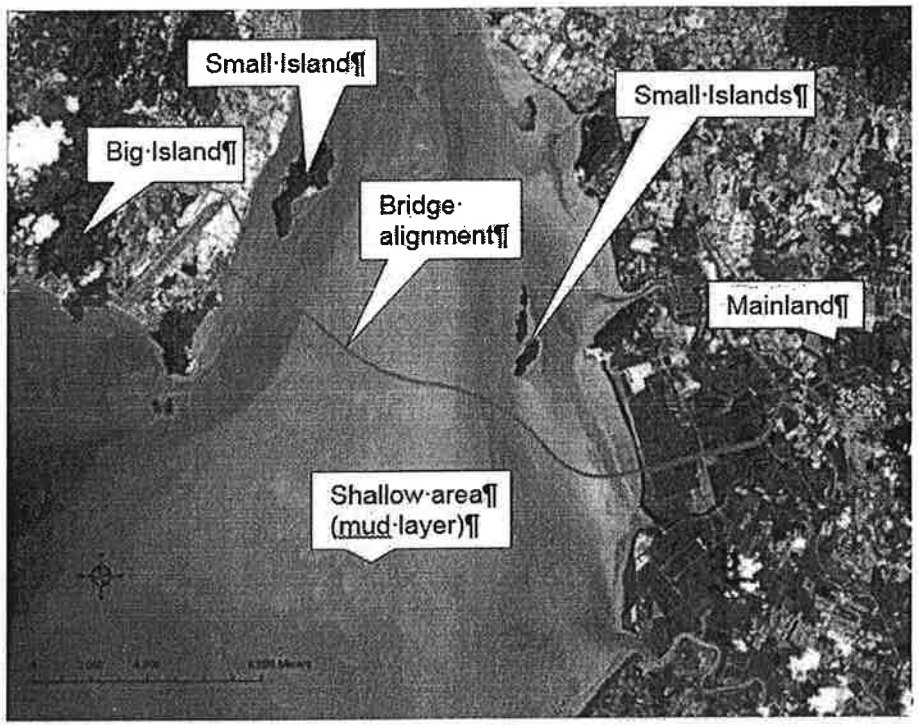

FIGURE Q3

b. Several mangrove re-planting projects along the west coast of Peninsular Malaysia were observed to be not successful. Many of the planted mangroves were not able to survive and eventually diminished. Identify **TWO (2)** possible causes for such destruction of these newly planted mangroves.

[10 marks]

4. **FIGURE Q4** shows the relative location of a proposed new seafront theme park complex to be developed at one of the popular sandy beach areas in east coast of Peninsular Malaysia.

a. As the representative of the Department of Irrigation and Drainage Malaysia, appraise whether the application for the proposed development is allowable. Elaborate your basis and rationale.

[10 marks]

b. Propose **TWO (2)** conditions which can possibly reverse the decision in part **Q4a**. Add a sketch with labels to illustrate.

[10 marks]

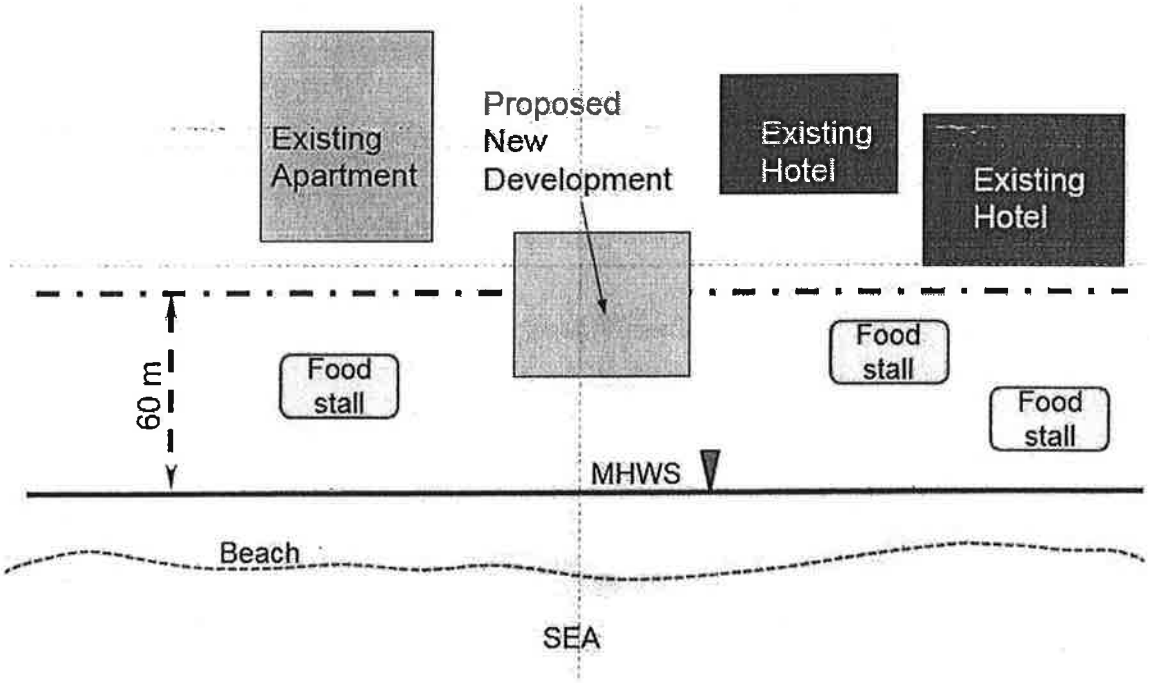

FIGURE Q4

5. a. **FIGURE Q5** shows layout of the on-going major land reclamation project which involves the expansion of Pulau Tekong. Appraise and elaborate **TWO (2)** main concerns related to the potential impacts to the surrounding hydrodynamic regime upon completion of the reclamation. Use sketch to illustrate.

[10 marks]

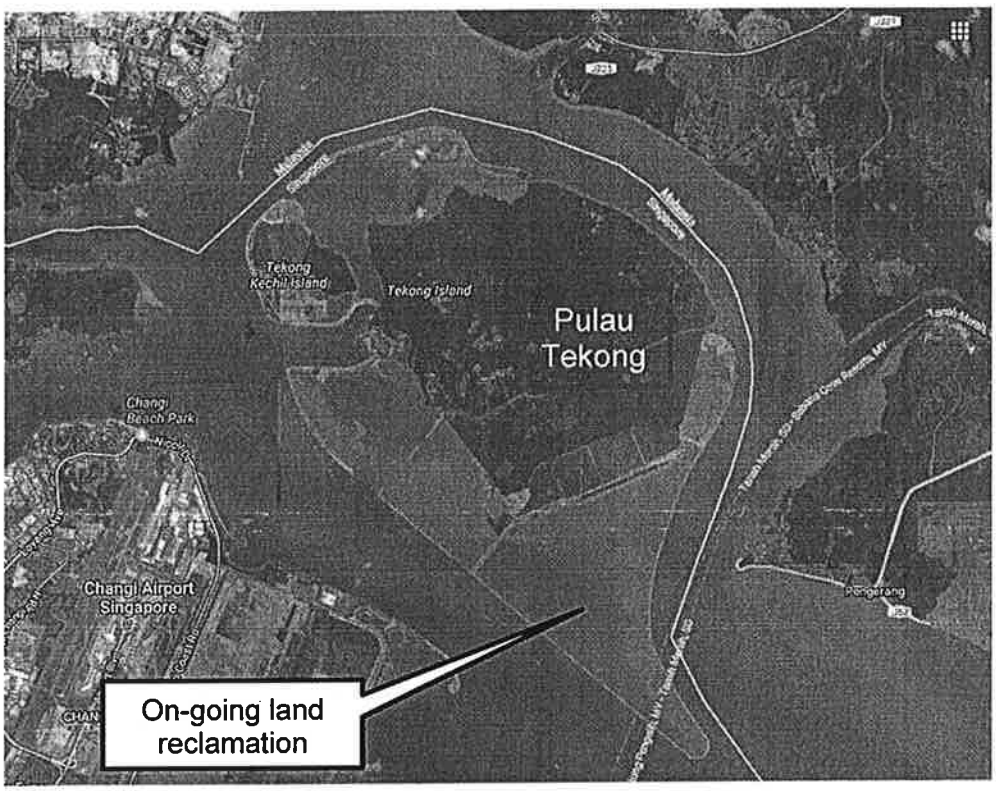

FIGURE Q5

b. A new combined-cycle power plant to generate electricity from coal is proposed near the coastal area in Selangor. The power plant will use sea water for its cooling system by the means of cooling water intake and hot water discharge pipelines. The beach profile within the area is considerably gentle and muddy in nature. Propose and elaborate **TWO (2)** conditions that will make such project unfavourable.

[10 marks]

-END OF PAPER-