Total No. of Questions : 6]

SEAT No. : ____

P14

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APR-17/BE/Insem.-15

B.E. (Civil)

WAVE MECHANICS

(2012 Pattern) (Open Elective - IV(E))

Time : 1Hour] ***[Max. Marks : 30***

Instructions to the candidates :

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Use of calculator is allowed.***
4) ***Assume Suitable data if necessary***

Q1) a) Define fully developed sea, partially developed sea, swell. **[6]**

b) Write a short note on Wave watch III, SWAN. **[4]**

OR

Q2) a) Discuss the process of wave generation and draw a definition sketch of wave propagation. **[4]**

b) What are the Phase resolving models and Phase averaging models and elaborate them in short. **[6]**

Q3) a) Derive equation for water particle displacement from mean position. **[5]**

b) A wave with a period of 10 sec in a deep water depth of 19.5 m and significant wave height of 6.5 m. Find the local horizontal and vertical velocities and accelerations at an elevation of Z= -3.8 m below the SWL when $\theta = 60^{o}$ **[5]**

OR

Q4) a) Derive linear dispersion relationship. **[4]**

b) Obtain expression for pressure below sea surface. **[6]**

P.T.O.

Q5) a) Enlist assumptions in the theory of diffraction **[4]**

b) A wave has 3m height and 12 seconds period in deep water. It travels towards shore over parallel bed contours. If its crest line makes an angle of 30 with the bed contour of 7.5 m before refraction. Calculate the wave height after crossing this contour line. **[6]**

OR

Q6) a) Derive equation for general refraction bye bathymetry **[5]**

b) What is wave breaking? Discuss with respect to interaction with current and solitary theory. **[5]**