Total No. of Questions : 12]

SEAT No. :

P2135

[Total No. of Pages : 3

[5254] -528
B.E. (Civil)
WAVE MECHANICS
(2012 Pattern) (Open Elective)

Time : 2½ Hours] ***[Max. Marks :70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***

2) ***Figure to the right indicate full marks.***

3) ***Use of electronic pocket calculator is allowed.***

4) ***Assume suitable data if necessary.***

Q1) a) Discuss the process of wave generation and draw a definition sketch of wave propagation. **[3]**

b) Write a short note on wave rider buoy. **[4]**

OR

Q2) a) What are the phase resolving and phase averaging models. Give suitable examples. **[4]**

b) Define : finite amplitude wave, significant wave height, zero cross wave period. **[3]**

Q3) a) Short note on Stokes wave theory. **[3]**

b) Enlist assumptions made in wave theories. **[4]**

OR

Q4) a) Derive expression for group wave velocity. **[4]**

b) Define celerity, group velocity, dynamic free surface boundary condition. **[3]**

P.T.O.

Q5) a) What is wave breaking? **[2]**

b) A wave has 3 m height and 7 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 10 m before refraction. Calculate the wave height after crossing this contour line. **[4]**

OR

Q6) a) Draw sketches for wave refraction in different cases. **[3]**

b) Write a short note on shoaling. **[3]**

Q7) a) Write steps of Gumbel's extreme value distribution method. **[6]**

b) Define random process or stochastic process. What do you mean by weekly stationary process? **[4]**

c) Discuss JONSWAP wave spectrum. **[6]**

OR

Q8) a) What is short term wave statistics and long term wave statistics. **[5]**

b) Write short note on Tucker method. **[5]**

c) Explain Weibull Distribution and Log Normal Distribution. **[6]**

Q9) a) Draw a typical beach profile and explain surf zone. **[4]**

b) What are the natural causes of shore line erosion. **[6]**

c) Enlist the coastal protection methods and elaborate any one in detail. **[6]**

OR

Q10) a) Define the terms sea, currents, surges, tides and Tsunamis. **[5]**

b) Explain the near shore beach system with sketch. **[5]**

c) Enlist the different dynamic beach responses to the sea and explain any one in detail. **[6]**

Q11) a) Enlist different factors affecting the littoral process and explain any one in detail. **[6]**

b) Explain the modes of sediment transport. **[6]**

c) Describe the mechanics of suspended sediment transport. **[6]**

OR

Q12) a) Explain the terms grain size distribution, fall velocity, permeability with respect to littoral drift. **[6]**

b) Explain the effect of offshore wave climate on littoral transport. **[6]**

c) Explain all the consolidated rock materials in littoral processes. **[6]**

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