**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, April 2023**

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|  | **2BT4165** | Roll No. | Total Printed Pages: 2 |
| **2BT4165** |  |
| B. Tech. II Year IV- Semester (Back) End Semester Examination, April 2023  **(CV)** | |
| **BCV04103 / BCV04107 : Hydraulic & Hydraulic Machine** | | | |

# Max. Time: **3** Hours. Max. Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.----------------------------------------------** **2.-----------------------------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | Enumerate the Rayleigh method for the analysis of different principle of hydraulic machine | **(6)** | **A** |
|  |  |  |  |  |
|  | **(b)** | Explain the different type of similarity. | **(6)** | **R** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** | **(a)** | Enumerate the Buckingham pie method for the analysis of different principle of hydraulic machine | **(6)** | **A** |
|  |  |  |  |  |
|  | **(b)** | What do you understand by hydraulic machine, explain it with suitable applications? | **(6)** | **R** |
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|  |  | **UNIT-II (CO2)** |  |  |
|  |  |  |  |  |
| **Q.3** | **(a)** | Derive the ration of maximum velocity to average velocity for laminar flow of circular pipe. | **(6)** | **D** |
|  |  |  |  |  |
|  | **(b)** | Prove that velocity of viscous flow is vary linear with the flowing fluid. | **(6)** | **A** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.4** | **(a)** | Compare (atleast five) the viscous and turbulent flow in terms of various fundamental aspect. | **(6)** | **R** |
|  |  |  |  |  |
|  | **(b)** | Derive the ration of maximum velocity to average velocity for laminar flow between two parallel plates. | **(6)** | **D** |
|  |  |  |  |  |
|  |  | **UNIT-III (CO3)** |  |  |
|  |  |  |  |  |
| **Q.5** | **(a)** | What do you understand by open channel flow? Explain by suitable example | **(6)** | **A** |
|  |  |  |  |  |
|  | **(b)** | Derive an expression for the discharge through a channel by Chezy’s formula | **(6)** | **A** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.6** | **(a)** | Differentiate the uniform and non-uniform flow by using mathematical equation | **(6)** | **R** |
|  |  |  |  |  |
|  | **(b)** | Find the velocity of flow and rate of flow through a rectangular channel of 6m wide and 2.5 m deep, when it is running half. The channel is having bed slope of 1 in 2000. Take chezy’s constant C=60. | **(6)** | **C** |
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|  |  | **UNIT-IV (CO4)** |  |  |
|  |  |  |  |  |
| **Q.7** | **(a)** | Explain in detail about specific energy curve. | **(6)** | **R** |
|  |  |  |  |  |
|  | **(b)** | Critically suggest the application and detail of parshal flume. | **(6)** | **R** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.8** | **(a)** | Derive an expression for critical depth and critical velocity | **(6)** | **A** |
|  |  |  |  |  |
|  | **(b)** | Derive the condition for maximum discharge for a given value of specific energy. | **(6)** | **A** |
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|  |  | **UNIT V (CO5)** |  |  |
|  |  |  |  |  |
| **Q.9** | **(a)** | Enumerate the .turbine and explain its complete working details. | **(6)** | **A** |
|  |  |  |  |  |
|  | **(b)** | Explain the different type of turbine. | **(6)** | **R** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.10** | **(a)** | Enumerate the .pump and explain its complete working details. | **(6)** | **A** |
|  |  |  |  |  |
|  | **(b)** | Explain the different type of Pump. | **(6)** | **R** |