

Mid-West University
Examinations Management Office
Semester End Examinations 2081

Bachelor level/ B.E. Hydropower/ 5th Semester

Time: 3 hours

Subject: Fundamentals of Hydropower (HE452/HE302)

Full Marks: 50

Pass Marks: 25

- *Attempt all the questions*
 - *Figures in the margin indicate full marks.*
 - *Assume suitable values, with a stipulation, if necessary.*
 - *Candidates are required to answer the questions in their own words as far as possible.*
1. a) What are the major institutions involved in hydropower development sector in Nepal? Also explain about the opportunities and challenges of hydropower development in Nepal. (2+3)
b) A hydropower plant designed based on 42% of time available in Karnali river has a net head of 300 m and overall efficiency of the plant is 87% and 12% of minimum flow in a river is required to be left for environmental and downstream users. If the plant is used as a peak load plant operating only for 6 hours a day. Determine the installed capacity of the plant if the plant
 - i) Without Pondage
 - ii) With Pondage but allowing 10% of water to be lost in evaporation. (5)
- | Month | Jan | Feb | Mar | Apr | May | Jun | July | Aug | Sept | Oct | Nov | Dec |
|-----------------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----|
| Q,m ³ /sec | 300 | 315 | 335 | 500 | 650 | 2200 | 2500 | 2720 | 2490 | 1800 | 1300 | 700 |
2. a) Explain the suitability of Storage and PROR project over ROR project in Nepal. What are the major institution involved in hydropower development sector in Nepal? (3+2)
b) Explain about basic investigation and purpose oriented investigation in hydropower projects also explain the risk associated with hydropower projects. (4+1)
 3. a) The load on hydropower plant varies from minimum of 30 MW to 60MW. Two turbo generator of capacities 33 MW have been installed. Calculate plant factor, load factor and utilization factor. (5)
b) How can we plan the position of different structural component of hydropower? Also explain about the selection of position of intake and power house. (2+3)
 4. a) What do you mean by dam height optimization? Briefly explain the process of optimization of installed capacity of hydropower project. (2+3)
b) Explain the types of maintenance of hydropower projects. How maintenance of electro mechanical equipment's can be done in hydropower projects? (3+2)
 5. a) What are the initial test to be done during hydropower production? Explain about erection, acceptance and commissioning works during operation of hydropower projects. (2+3)
b) What may be the consequences of high dam to environment explain briefly? How could you relate hydropower and tourism in Nepal? (2+3)

The End