

B.Tech (Civil), Elective-III, 7th Semester (G-Scheme)  
Examination, November-2023

**HYDRO POWER ENGINEERING**

**Paper -PEC-CEEL-411-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*Note : Question no. 1 is compulsory. Attempt total five questions, selecting one question from each unit. All questions carry equal marks.*

1. **Compulsory question; 6 parts :** 6×2.5=15

- (a) Types of turbine
- (b) Advantages of underground power houses
- (c) Name the principles types of power plants.
- (d) What is unit discharge?
- (e) On what factors selection of turbines depends?
- (f) Define the term "storage" and "pondage".

**Unit-I**

2. (a) What are the different source of energy? Differentiate between renewable and non-renewable energy sources with their advantages and disadvantages.

7.5

(b) What is the necessity to demand future demand of load? Explain in detail. 7.5

3. (a) What are the advantages and disadvantages of the hydropower plant? 7.5

(b) What is Load curve? Explain with sketch. Discuss its use. 7.5

### Unit-II

4. (a) What do you mean by "run of river plants"? Describe the general layout of run of river plants. 7.5

(b) What are different types of pump storage plants? Describe reversible turbines and cavitation in turbines. 7.5

5. (a) Explain the basic feature of a pumped storage plants and enumerate its advantages. 7.5

(b) Define valley dam power plant. 7.5

### Unit-III

6. (a) What do you mean by water conveyance system? Describe in details. 7.5

(b) What are various types of penstocks? Explain each. 7.5

7. (a) What is the function of anchor blocks? What are the forces which should be taken into account in their stability analysis? 7.5

(b) What are surge shafts and its types? What are the functions of surge shafts. 7.5

#### Unit-IV

~~8.~~ (a) What are the different types of turbines? Describe the general criterion for the selection of turbine. 7.5

(b) What is the significance of surge tank and state its advantage? 7.5

9. (a) Write short note on design theory of draft tube and cavitation in turbines in detail. 7.5

(b) Sketch the detail of typical power house and show all components. Also describe the functions of the component briefly. 7.5

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B. Tech. (Civil) 7th Semester (G-Scheme)  
Examination, November-2023

**CONSTRUCTION PLANNING AND  
MANAGEMENT**

**Paper-PCC-CE-401-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

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**Instructions :**

- (i) **Question No.1 is compulsory.**
- (ii) **Attempt one question from each section.**
- (iii) **All questions carry equal marks.**
- (iv) **Assume missing data, if any, suitably.**

1. Describe the following:

- (a) Write about the Event and Activity.
- (b) Write about hoists.
- (c) What is project planning?
- (d) What are the uses of compaction?
- (e) What is crashing a project in project management?
- (f) Bar chart

**Section-A**

2. Draw a network diagram for the given activity and durations in the following table:

3521-P-4-Q-9 (23)

[P. T. O.]

Find out the critical path, EST, EFT, LST, LFT, total float and free float.

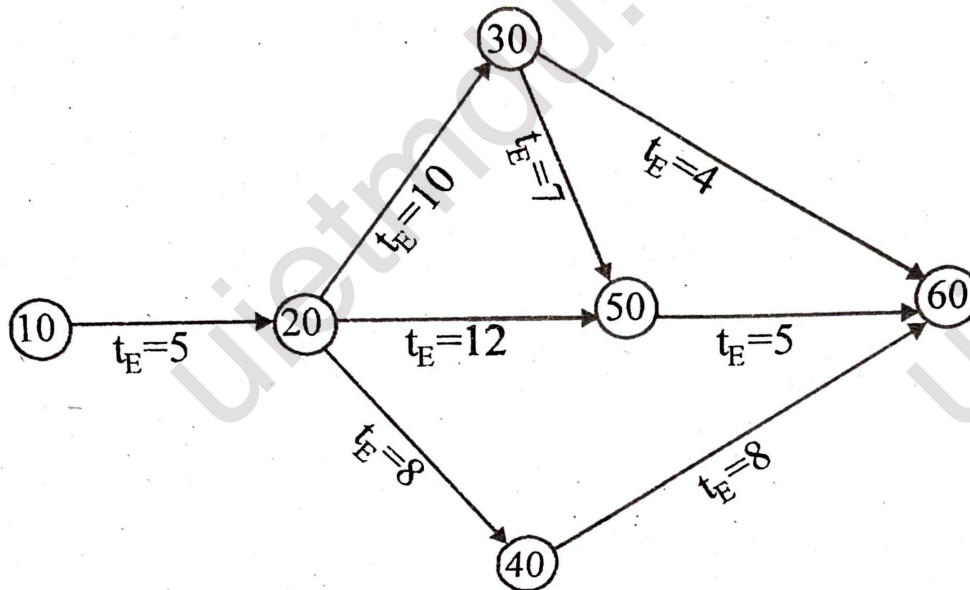
Description of activity	Activity symbol	Preceding activity	Succeeding activity	Duration days
Dig foundation	A	None	B	3
Place form work	B	A	C	6
Place concrete	C	B	G	6
Obtain steel	D	G, H	None	7
Cut and bent	E	None	F	4
Place steel reinforcement	F	E	G	3
Obtain materials for concrete	G	F, C	D	2
	H	None	D	12

3. (a) What are different elements present in PERT network and explain with an example?
- (b) What do you mean by frequency distribution? What is the use of beta distribution in PERT?

### Section-B

4. The network of a certain project is shown in Fig. with the estimated durations of various activities. Determine the following:
- (a) Earliest event time and latest event time.

- (b) Earliest and latest start and finish times of each activity.
- (c) Total and free floats for each activity.
- (d) Critical path for the network.



5. Explain about crashing for optimum cost and crashing for optimum resources.

### Section-C

6. (a) Describe the various applications of a bulldozer.  
 (b) Discuss various operations that can be performed by a bulldozer.
7. Write short notes on:
- Placing of concrete
  - Form work
  - Fabrication and erection

**Section-D**

8. (a) Discuss BOT technique in detail.
- (b) What do you mean by updating? Why is it essential?
9. (a) Explain what do you mean by resource levelling. Explain the step-by-step process for resource levelling.
- (b) Discuss the resource allocation problems. What are the methods of solving the problems?

**B. Tech. 7th Semester (Civil Engg.) Elective - IV  
(G-Scheme) Examination, November-2023**

**WATERSHED MANAGEMENT**

**Paper- PEC-CEEL-415-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. **No complaint** in this regard will be entertained after examination.*

**Note:** *Attempt **five** questions in all, selecting **one** question from each section. **Question no. 1 is compulsory.**  
All questions carry equal marks.*

1. Describe the following: .

- (a) Principle of Soil Erosion
- (b) Use of water resources
- (c) Geographical Information System
- (d) Drought Mitigation Planning
- (e) Groundwater flow
- (f) Standard modeling approaches

15



**Section-A**

2. (a) What is the concept of watershed and also explain the need of watershed management?  
(b) Explain the sustainable integrated watershed management and natural resources management. 15
3. Explain the causes and types of soil erosion. Also, explain the method of soil conservation structural and non-structural measures. 15

**Section-B**

4. Explain the rainwater harvesting and roof catchment system for watershed management in detail. 15
5. Explain the modeling of the rainfall-runoff process and also explain the concept of subsurface flow and groundwater flow. 15

**Section-C**

6. Explain the role of the decision support system in watershed management. 15
7. What are the various applications of Geographical Information Systems and Remote sensing in watershed management. 15

**Section-D**

8. (a) Describe the stormwater management and also explain the design of the drainage system.
- (b) Explain the concept of flood control and reservoir operation. 15
9. (a) Explain a case study on flood damage.
- (b) What do you mean by drought assessment and its classification? 15

**B.Tech (Civil), 7th Semester (G-Scheme)  
Examination, November-2023**

**DESIGN OF HYDRAULIC STRUCTURE**

**Paper -PCC-CE-405-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*Note : Question no. 1 is compulsory. Attempt total five questions selecting one question from each unit. All questions carry equal marks.*

1. Define the following :

6×2.5=15

- (a) Mending Type
- (b) Dicken's formula for calculating maximum discharge
- (c) List the forces acting in a gravity dam.
- (d) Flood routing method
- (e) Explain Ogee type of spillway.
- (f) What are the functions of gallery in a gravity dam?

**Unit-I**

2. What are the objectives of river training work? Describe its classification.

15

3523-P-3-Q-9(23)

[P.T.O.]

3. Design various method adopted for design of guide bank. 15

### Unit-II

4. (a) Define cross drainage works. Describe its types. 7.5
- (b) Explain the Khosla's theory of independent variables. 7.5
5. Design a suitable cross drainage work given the following data at the site of the crossing of two streams of water
- Irrigation channel
- Full supply discharge - 350 cumecs
- Full supply level - 202.5m
- Canal bed level - 197.5m
- Full supply depth - 4.7m
- Side slop - 0.5H: 1V 15

### Unit-III

6. (a) What is spillway? Discuss factors affecting its capacity. 7.5
- (b) What is a Spillway? Explain Ogee type of spillway. 7.5

7. (a) Define different types of fall with suitable diagram.

7.5

(b) Explain stepwise procedure for designing the Sarda types fall.

7.5

#### Unit-IV

8. (a) Define different types of dam.

7.5

(b) Explain various modes of failure of gravity dam.

7.5

9. (a) Describe various problems associated in dam construction.

7.5

(b) Explain thin cylinder method of design of Arch dam.

7.5

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B. Tech. (Civil) 7th Semester (G-Scheme) Examination,

November-2023

ADVANCED STEEL STRUCTURE

Paper-PCC-CE-403 G

Time allowed : 3 hours ] [ Maximum marks : 75

*Note : Question No. 1 is compulsory. Attempt total five question selecting one question from each section. All questions carry equal marks. Use of IS 800-1984 or 2007, IS 875-1975, Steel table is allowed. Assume suitable data.*

1. Write short note on the following : 6×2.5
- (i) Types of cold framed section.
  - (ii) What is meant by stiffened & unstiffened seat connection ?
  - (iii) What are the sections that are normally used as purlins or Girts ?
  - (iv) List out the various uses of steel towers.
  - (v) What are the forces acting on a steel stacks ?
  - (vi) Define plate girder.

## Unit-I

2. (a) How you will be design of bearing bolts subjected to eccentric loading in the plane perpendicular to the groups of bolts. 7.5
- (b) Explain cold formed light gauge sections and what are the problem associated with light gauge sections. 7.5
3. A bracket is welded to a stanchion by filler welds having a throat thickness of 9mm and a load of 180 kN is applied in the plane of the bracket, as shown in the figure 1. The weld extends round three sides and has the given dimensions. Determine the maximum stress in the throat of the weld. 15

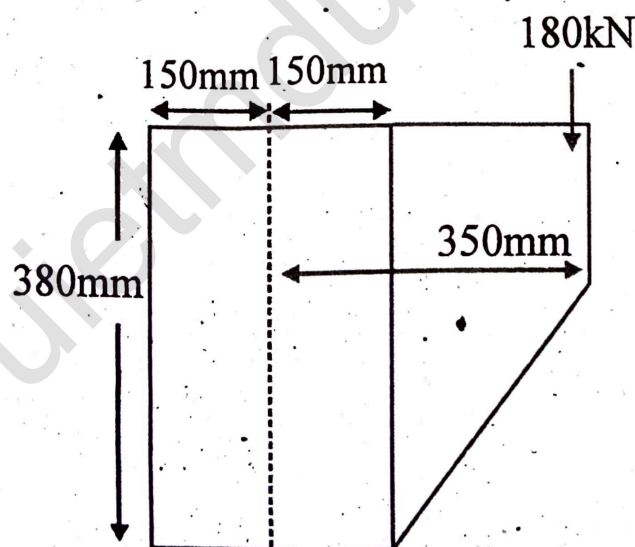


Figure. 1

**Unit-II**

4. (a) Write about the design aspects of transmission line towers. 7.5
- (b) Explain various steps involved in the design of gantry girder. 7.5
5. Briefly explain about the various structural configurations adopted in towers with neat diagrams. Also explain about the types of bearing systems adopted in towers. 15

**Unit-III**

6. Design a riveted self supported steel stack located in the outskirts of Bhopal for the following data :
- Terrain category 2
- Topography almost flat
- Height of the steel 80m
- Diameter of the steel stack 3m
- Thickness of brick lining 100mm
- Corrosional Allowance 3mm
- Design the stack at the base. Also design the base plate and the anchor bolts. 15



7. Design a rectangular tank of capacity 1,10,000 litres of water supported over a 12m high staging. Columns are supported over concrete pedestal of M-15 concrete. The bearing capacity of soil is 100 kN/m<sup>2</sup>. Design wind pressure may be assumed to be 1.05 kN/m<sup>2</sup>. Plates of 1.25m width and 8.75m length are available. Design :
- (i) The bottom plate 7.5
- (ii) The bottom tee-cover 7.5

#### Unit-IV

8. Design the mid span section of a welded plate girder for span 25m, carrying a udl of 120 kN/m for the entire length including self-weight. Also design the intermediate stiffeners provided for the plate girder. 15
9. What are different elements of plate girder ? Write the steps for design of a plate girder. 15

**B. Tech. (Civil) Elective-V 7th Semester  
(G-Scheme) Examination, November-2023  
RAILWAY AND AIRPORT ENGINEERING**

**Paper-PEC-CEEL-419-G**

Time allowed : 3 hours]

[Maximum marks : 75

**Instructions :**

- (i) *Question No.1 is compulsory.*
- (ii) *Attempt one question from each section.*
- (iii) *All questions carry equal marks.*
- (iv) *Assume missing data, if any, suitably.*

**1. Describe the following:**

- (a) Fish plate
- (b) Coning of wheel
- (c) Interlocking
- (d) Superelevation
- (e) Permanent way
- (f) Airport site selection

**Section-A**

- 2. (a) Illustrate the various types of failures with sketches.**
- (b) What is the necessity of bearing plates? Under what circumstances the use of such plates is warranted?**

3. Enumerate and explain the various resistances which have to be overcome by a moving train?

### Section-B

4. Explain right hand turn out and obtuse angle crossing with the help of neat sketches.
5. (a) Describe semaphore type of signal with sketch.  
(b) Explain the working of marshalling yard with neat sketch.

### Section-C

6. (a) Explain how the maintenance of the surface of rails is done.  
(b) Discuss the modern developments in railways in India.
7. (a) What factors govern the size and shape of a tunnel? Draw a cross section of a typical purpose tunnel.  
(b) What are the basic operations involved while doing tunneling in rocks?

### Section-D

8. Sketch typical airport layouts for the basic runway configuration.

( 3 )

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9. Write short notes on:-

- (i) Cross wind component
- (ii) Hangar
- (iii) Wind coverage
- (iv) Apron

**3530**