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

Examination, December–2025

CONSTRUCTION PLANNING AND MANAGEMENT

Paper–PCC-CE-401-G

Time allowed : 3 hours] *[Maximum marks : 75*

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

Note : *Attempt any **five** questions. All questions carry equal marks. Assume Suitable Data if not Provided use of relevant code is allowed.*

1. Write a short note on the following :

   (a) What are dummy activity and its uses ? 2.5

   (b) What is PPT technique in CPM updating ? 2.5

   (c) Define dual role event and successor event ? 2.5

   (d) What do you understand about HIERARCHIES ? 2.5

   (e) Write briefly about resource smoothing. 2.5

   (f) What do you understand abuot Histogram ? 2.5

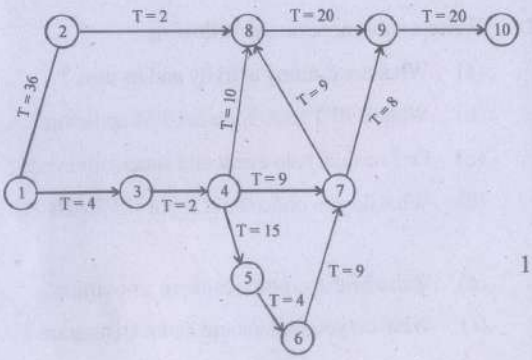
Section–A

2. What is the milestone chart ? How does it differ from a bar chart ? How can milestone chart be developed in to a network ? 15

3. What is mean by Probability distribution curve ? Differentiate clearly between normal probability curve and beta distribution. 15

Section–B

4. The network of the project is shown in figure, along with estimated time of completion of each activity. Compute the activity times, free float, independent float and total float for each activity and also locate the critical path.



15

5. What do you mean by Optimum duration ? Explain the steps are used in time cost optimization. 15

Section–C

6. Name the equipment's needed for compacting concrete and explain their uses in detail. 15

7. Discuss the form work and explain the methods of placing of concrete. 15

Section–D

8. (a) What do you understand by Updating ? Why is it essential ? 7

   (b) Explain the steps used in updating in CPM. 8

9. Discuss the resources allocation problem. What are the methods of solving the problems ? 15

B.Tech. (Civil Engg.) 7th Semester (G-Scheme) Examination, December–2025

ADVANCED STEEL STRUCTURE

Paper– PCC-CE-403-G

Time allowed : 3 hours] *[Maximum marks : 75*

Before answering the questions, candidate 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 carries equal marks. IS* 875:1983 *is allowed.*

1. Describe the following: 15

(a) Beams-Column connection

(b) Various types of cold formed section

(c) Braces and stepped column

(d) Microwave Tower

(e) Types of bracing of tower

(f) Types of steel stack

Section-A

2. Design a bolted end plate connection between an ISMB 400 beam and ISHB 200 @ 40kg/m column so as to transfer hogging factored bending moment of 150 knm

and a vertical factored shear of 150 kN. Use HSFG bolts of diameter 22mm. Assume 6 HSFG 8.8 grade bolt of 22mm diameter and 180 × 600 mm end plate. 15

3. Determine the effective section modulus of 188×94 × 18.03 × 3mm lipped channel section cold formed from galvanized steel sheet with 0.06mm thick coating. The yield strength and elastic modulus of the material of channel section are 280 MPa and 205×10^3 MPa respectively. Take K=5.34 15

Section-B

4. Design the purlin for the following roof truss arrangement: 15

Span of roof = 22.5m, Spacing of truss = 8 m *c/c*, Spacing of purlin along the slope of roof truss = 1.29m c/c and at the ends and near ridge = 1.23m c/c.

5. Define tower. What are the forces that act on the microwave towers? Explain the analysis and design steps of microwave tower. 15

Section-C

6. Design a rectangular steel overhead tank to hold 100,000 liters of water. The height is 2.2m and depth of water is 2 m. Steel plates are available in 2 m and 1.2 m width and of any thickness. Design the bottom plate, the bottom tee cover and tie bar. 15

7. Design for Delhi a self-supporting steel stack of height 72m above the foundation. The diameter of cylindrical part of chimney is 3m. The foundation has to rest on the soil having a bearing capacity 180 kN/m^2. The topography at the site is flat and location of terrain category is 2. Design any three sections along with foundation. 15

Section-D

8. A plate girder has the following elements:

Top and Bottom plates: 480 × 28 mm each

Web plate: 1600 × 8 mm

Design the horizontal stiffeners. 15

9. (a) What is the meant by curtailment of plates and how this is done in plate girder? 7

(b) How the behavior of plate girder affected by holes in the web? Also explain when we need shear buckling of web? 8

B.Tech. (Civil Engg.) 7th Semester (G-Scheme)
Examination, December–2025

DESIGN OF HYDRAULIC STRUCTURE
Paper– PCC-CE-405-G

Time allowed : 3 hours] *[Maximum marks : 75*

Before answering the questions, candidate 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** in all, selecting **one** questions from each unit. All questions carry equal marks, Assume suitable data if not provided use of relevant code is allowed.*

1. Write a short note on the following:

   (a) Characteristics of sloping glacis basin 2.5

   (b) Operation and maintenance of canal 2.5

   (c) Explain bank pitching and launching apron 2.5

   (d) Describe aqueduct and super passage in detail 2.5

   (e) Energy dissipator and use of hydraulic jump as energy dissipator 2.5

   (f) Function of gallery in gravity dam 2.5

Section- A

2. Design and sketch a guide bank including launching apron from the following data: 15

   Maximum discharge> 10000 cumecs

   Highest flood level= 106 m

   River bed level= 100m

   Average diameter of river bed material = 0.1 mm

3. What do you mean by Flood routing? Explain the procedure of different methods of flood routing in detail. 15

Section-B

4. What do you mean by Cross drainage work? Also write down the design step of cross drainage work. 15

5. Distinguish between the barrage and weir. Also explain the design step of barrage and weir. 15

Section-C

6. Design a suitable section for the overflow portion of a concrete gravity dam having the downstream face sloping at a slope of 0.7 H : 1 V. The design discharge for the spillway is 6000 cumecs. The height of the spillway crest is kept at RL 204 m. The average river bed level at the site is 100 m. The spillway length consists of 6 spans having a clear width of 10 m each. Thickness of each pier may be taken to be 2.5m 15

7. Which are the main types of falls? Briefly discuss about each fall with neat sketches where required. 15

Section-D

8. What do you mean by Gravity dam? Explain briefly with neat sketches the different forces that may act on gravity dam and also explain advantage and disadvantage of gravity dam. 15

9. What do you mean by Earthen dam? Enumerate the types of earthen dams, and draw neat sketches and also write their advantage and disadvantage. 15

B.Tech. 7th Semester Elective III (Civil Engineering)

(G-Scheme) Examination, December-2025

HYDRO POWER ENGINEERING

Paper : PEC-CEEL-411-G

Time allowed : 3 Hours] *[Maximum marks : 75*

***Note :** Attempt **five** questions in total, **Question No. 1** **being compulsory** and selecting **one** from each section. Assume missing data, if any suitably.*

1. (a) Compare thermal power and hydropower in terms of efficiency and environmental impact.

   (b) Classify hydropower stations.

   (c) Define load factor, capacity factor, and diversity factor.

   (d) Name the components of a typical intake.

   (e) What is a surge tank and why is it used?

   (f) Define substructure and superstructure in a power house.

   6×2.5=15

Section-A

2. (a) Explain the different sources of energy and highlight the role of hydropower in sustainable energy generation. 8

   (b) Discuss the advantages and limitations of hydropower compared to thermal power plants. 7

3. (a) Explain the significance of load curves and load duration curves in hydropower planning. How can these curves be used to predict future energy demands? 10

   (b) Calculate the capacity factor if the actual energy generated in a year is 200 GWh and the installed capacity is 50 MW. 5

Section-B

4. Explain the general layout of a run-of-river hydropower plant. How does it differ from a storage-type plant in terms of design and operation? 15

5. (a) Describe the different types of pump storage plants. How do they vary in terms of design and operation? 10

   (b) Discuss the advantages and disadvantages of pump storage plants. In what scenarios are they most beneficial? 5

Section-C

6. (a) Analyze the factors influencing the design of intake structures. How do site conditions and environmental considerations impact their design? 8

   (b) Describe the maintenance requirements for intake structures. What are the common issues faced, and how can they be addressed? 7

7. Explain the design criteria for penstocks. How do factors like head, flow rate, and material properties affect the design? 15

Section-D

8. Classify turbines used in hydropower plants. Discuss the selection criteria for choosing the appropriate turbine type for a given site. 15

9. Discuss the considerations for determining the number and size of units in a powerhouse. How do factors like load demand and site conditions influence these decisions? 15

B. Tech. 7th Semester (Civil) Elective-IV

G-Scheme Examination, December-2025

RIVER ENGINEERING

Paper : PEC-CEEl-417-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: 15

   (a) Write a note on delta formation.

   (b) Outline the merits of Bio-engineering Techniques.

   (c) What are aggrading and degrading type of rivers?

   (d) List out the purpose of a gryon.

   (e) Define sediment.

Unit–I

2. List various classifications of river morphology. Explain Rosgan's classification in detail. 15

3. (a) Give a detailed account on various types of rivers. 7.5

(b) Describe the braided rivers. 7.5

Unit–II

4. (a) What are the cut-offs? How are they used for river training? 7.5

(b) Explain about various forms of bed forms in steady flow rivers with the help of figures. 7.5

5. What are the basic factors controlling process of meandering? Explain general features of meandering. 15

Unit–III

6. (a) What are the impacts of flooding on socio-economic development and agriculture? 7.5

(b) Explain the mechanism of alluvial rivers and delta formation and control. 7.5

7. What is bio-engineering techniques used for? What are their limitations? Explain Brush Mattress technique in detail with its advantages & disadvantages. 15

Unit–IV

8. What is the importance of River training works? What are the factors on which meandering of river depends? 15

9. (a) Design various method adopted for design of guide bank. 7.5

(b) Elaborate on various measures taken for bank protection. 7.5

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B.Tech (Civil Engineering) Elective-V

7th Semester (G-Scheme) Examination,

December-2025

RAILWAY AND AIRPORT ENGINEERING

Paper-PEC-CEEL-419-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in total, **Q. No. 1 being compulsory** and selecting **one** question from each section.*

1. (a) Name the various types of rails in use.

   (b) How is track modulus expressed ?

   (c) Name the various methods of tunnelling in hard and soft rocks.

   (d) Define 'creep of rail'.

   (e) What is the purpose of providing marshalling yards ?

   (f) Why is it necessary to provide adequate drainage facility for a railway track ?

Section-A

2. (a) List the various types of sleepers used on Indian Railways. Which one would you consider to be the best for modern tracks and why ? 8

   (b) What are the effects of creep of rails ? What leads to the increase of creep ? 7

3. (a) A 8° curve track diverges from a main curve of 5° in the opposite direction. In the layout of a BG yard, calculate the superovulation and the speed on the branch line when the maximum speed permitted on the main line is 45 km/h. 10

   (b) Explain the following terms and state the circumstances under which they occur : 5

   (i) Negative superelevation

   (ii) Grade compensation on curves.

Section-B

4. (a) Draw a neat sketch of left-hand turnout and name its various components. 10

   (b) When is it necessary to recondition worm out crossings ? Describe in detail one of the methods of reconditioning a crossing. 5

5. (a) What are the functions of a railway station ? Explain briefly the various requirements of a railway station at an important city. 10

   (b) Briefly describe the absolute block system of controlling the movement of trains for single and double lines ? 5

Section-C

6. (a) Explain the system of annual maintenance of rail tracks on straight portions, including the several operations involved therein. Explain these operations in detail ? 8

   (b) Enumerate all the important work which may have to be undertaken for strengthening and improving an existing track so that higher speeds are permissible on it. 7

7. Why are railway tunnels necessary ? Draw a sketch to illustrate a single-track railway tunnel. 15

Section-D

8. Describe all the factors that must be considered in the selection of an airport site. 15

9. What is airport / runway capacity ? What are the main factors affecting runway capacity ? How does capacity change under Visual Flight Rules (VER) versus Instrument Flight Rules (IFR) ? 15