



Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai - 400058



END SEMESTER EXAM MAY JUNE 2026-SET-A

Max. Marks: 50

Duration: 2 Hrs

Class: B. Tech

Final Year B.tech Civil Sem-VIII Semester: VIII

Name of the Course: Environmental Impact Assessment

Program: Civil

Course Code: OEBTC815

Instructions:

- Question 1 is compulsory. Attempt any 4 of remaining 6.
- Draw neat sketches/diagrams wherever required and give reasoning wherever required
- Assume suitable data if necessary and state them clearly
- Figure on right indicate maximum points for the given question, course outcomes attained and Bloom's Level

19/5/26

QN	Questions	Pts	CO	BL	MN
Q1	State whether each statement is TRUE or FALSE. You MUST give a reason for every answer — whether True or False. Each statement carries 2 marks (1 mark answer + 1 mark reason).	10	1-4	3	1-6
i	Under EIA Notification 2020, all Category 'A' projects require Prior Environment Clearance (prior-EC) exclusively from the Ministry of Environment, Forest and Climate Change (MoEFCC) and cannot be appraised at the State level under any circumstances.	2			
ii	According to EIA Notification 2020, Category 'B2' projects are always placed before the Appraisal Committee for scrutiny before receiving their Prior Environment Permission (prior-EP).	2			
iii	The study area for collection of baseline data in an EIA is defined as 10 km around the project boundary for Category 'A' projects and 5 km for Category 'B' projects.	2			
iv	Under EIA Notification 2020, Scoping is mandatory for all projects listed in the Schedule, including Category 'B2' projects	2			
v	In noise impact assessment, doubling the sound pressure level results in an increase of 6 dB(A).	2			
Q2	Explain the complete Prior Environment Clearance (prior-EC) process for a Category 'A' project step by step. Your answer must cover all of the following: (a) Name and briefly explain each of the six stages in the correct sequential order. [3] (b) State the Regulatory Authority and Appraisal Committee responsible at each stage. [2] (c) List the key timelines (in working days) mandated by EIA Notification 2020 for: (i) scrutiny of application, (ii) appraisal by committee, (iii) decision by Regulatory Authority, and (iv) public hearing completion. [3]	10	2	4	3



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	(d) Draw a neat flowchart showing the sequence of stages from application to grant/rejection of prior-EC. [2]				
Q3	A new integrated steel plant with a crude steel production capacity of 1.2 million tonnes per annum (MTPA) is proposed in Dhanbad district of Jharkhand. The proposed site is located 8 km from a Wildlife Sanctuary notified under the Wildlife (Protection) Act, 1972 and 3 km from an inter-state boundary. Answer the following: (a) Identify the category (A / B1 / B2) of this project under EIA Notification 2020 with justification. [2] (b) Examine whether the General Condition applies. If yes, what is its consequence for the appraisal process? [2] (c) List the specific Terms of Reference (ToR) you would expect the Appraisal Committee to prescribe for this project, beyond the Standard ToR. Give at least six parameters. [3] (d) Identify five major environmental impacts anticipated from this steel plant (covering air, water, land, noise, and ecology) and briefly state one mitigation measure for each. [3]	10	3	4	4
Q4	You are the EIA consultant for a large proposed reservoir dam (River Valley project, 80 MW hydropower, culturable command area of 55,000 hectares) in Madhya Pradesh. Explain the water impact assessment methodology for this project under the following heads: (a) Baseline hydrological data collection: List at least eight hydrological parameters to be measured and state why one year of baseline data (including monsoon) is required for river valley projects. [3] (b) Prediction methods: Briefly explain any two of the three approaches — professional judgement, extrapolation from similar projects, and mathematical modelling — for predicting water quantity and quality impacts. [3] (c) Potential water impacts: Identify four major water-related impacts of the dam project (e.g., alteration of river hydrology, sedimentation, waterlogging in command area, downstream flow reduction) and propose one mitigation measure for each. [4]	10	4	4	6
Q5	A pharmaceutical company has been operating for more than 20 years at a site with the following characteristics: porous, filterable soil; phreatic (groundwater) level at 1.5 m depth; located adjacent to an estuary. The company discharges all toxic and gene-altering effluents directly into the estuary and onto the soil — no treatment, no sewers. It operates 20 hours a day, seven days a week. The	10	4	4	6



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	municipality has commissioned an EIA study as the area is now proposed for a residential complex (10 acres). (a) Identify and explain five major water-related environmental impacts of this existing industrial activity on the surrounding environment. [4] (b) State which water studies are most important to be carried out for this EIA and justify why each is necessary. [3] (c) Propose five specific water-related mitigation measures to be included in the Environmental Management Plan (EMP) for the proposed residential complex. [3]				
Q6	A construction site for a new overpass bridge operates for 10 hours during daytime. Noise level readings (in dB(A)) taken once every hour are: 75, 80, 72, 85, 78, 82, 70, 88, 76, 83. (a) Define Leq (equivalent continuous noise level) and write its formula. Explain why Leq is preferred over a simple arithmetic average of noise readings. [3] (b) Calculate the Leq for the 10-hour period using the readings given above. Show all working. [4] (c) The permissible daytime noise standard for a residential/commercial area is 65 dB(A) and for an industrial area is 75 dB(A). Compare your computed Leq against these standards and state whether corrective action is needed. [1] (d) Propose four engineering or administrative noise mitigation measures that can be implemented at this construction site. [2]	10	4	3	4
Q7	A proposed coal mining project with a lease area of 85 hectares is located in Odisha. The site is 4 km from a notified eco-sensitive zone and 6 km from a Wildlife Sanctuary. Three indigenous tribal communities (two on the verge of extinction) reside in the 5 km study area. Two seasonal rivers cross through the mining lease area. (a) Identify the category of the project and state whether the General Condition applies. List all regulatory clearances (beyond prior-EC) that must be obtained before commencement. [2] (b) Describe the Social Impact Assessment (SIA) that must be conducted, covering the aspects of tribal displacement, livelihood, cultural sites, and Rehabilitation & Resettlement (R&R) planning. [3] (c) List five major environmental impacts (covering land, water, ecology, air, and socio-economic dimensions) expected from this mining project. [3] (d) Propose five mitigation measures, each clearly linked to one of the five impacts identified above. [2]	10	4	4	1-6



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End Semester 2026 Examinations



SET A

Open Elective Sem VIII

Program: B TECH CME

Course Code: OE BTC 812

100

Duration: 03 hours

Maximum Points:

Final Year B. Tech Sem - VIII

Course Name: Human Resource Development & Organizational Behaviour

19/5/26

Instructions

- Question 01 is Compulsory
- Out of remaining Case Study attempt any 01
- Answers should demonstrate **application of internship experience, analytical thinking, and practical understanding of HRD and OB concepts.**
- Wherever relevant, support your answers with examples from organizations and workplace observations.

Sr. No	QUESTIONS	Po int s	BL	CO
Q.1.	(Answers should demonstrate application of internship experience, analytical thinking, and practical understanding of HRD and OB concepts of the company that you have done your internship. Please mention the company profile, job profile). During internships, engineering students work with teams, supervisors, clients, and organizational systems. Human Resource Development and Organizational Behaviour help students understand workplace functioning beyond technical tasks. Answer The Following:			
A.	Explain the role of Human Resource Development in improving employee competence, productivity, and organizational growth. Illustrate your answer with examples from internship settings.	20	L3	02
B.	Discuss how Organizational Behaviour helps in understanding individual behaviour, group dynamics, and organizational culture in the workplace.	10	L4	03
C.	Briefly explain any two principles of management that are relevant for interns working in organizations. Explain how these principles influence workplace effectiveness.	10	L4	01
D.	During internships, many students observe differences in communication style, authority, motivation, and teamwork across departments. Explain why understanding these dimensions is important for young engineers.	20	L5	02

Q.2.	Case Study: A group of engineering interns at Tata Consultancy Services (TCS) was assigned to support a digital transformation project. The interns came from different engineering branches and were expected to work with software developers, testing teams, and project managers. During the first month, the project manager observed several issues: • Some interns were technically strong but hesitant to communicate in meetings. • A few interns preferred working independently and avoided team discussions. • Deadlines were missed because task responsibilities were not clearly understood. • One intern felt that his contribution was ignored, leading to low motivation. The HR department decided to conduct a short intervention involving mentoring, role clarification, and feedback sessions. Answer the following Questions:			
A.	Identify the major organizational behaviour issues reflected in the case.	10	L2	02
B.	Explain how motivation, communication, and team dynamics affected project performance.	10	L1	03
C.	As an HRD executive, suggest suitable developmental interventions to improve intern effectiveness.	10	L5	05
D.	How can the project manager apply principles of planning, coordination, and control to improve team outcomes?	10	L3	02
OR				
Q.3.	Case Study: Organizational Behaviour and Human Resource Development Practices at Hindustan Unilever Limited (HUL) Hindustan Unilever Limited is one of India's largest fast-moving consumer goods companies. Its long-term success has often been linked not only to strong brands and market presence but also to its organizational practices and human resource development systems. HUL operates in a highly competitive environment where innovation, speed of decision-making, and employee adaptability are essential. To address these demands, the company has built a work culture that emphasizes performance, learning, collaboration, and leadership development. A significant feature of HUL's organizational behaviour is its emphasis on a participative and performance-oriented culture. Employees are encouraged to share ideas, take ownership of responsibilities, and contribute to decision-making processes. Managers at different levels promote open communication and			

	cross-functional coordination between marketing, sales, supply chain, finance, and operations. This creates an environment where teams work collectively toward common business goals. HUL also follows a culture of accountability where individual performance is linked with organizational outcomes. Employees are given clearly defined targets, regular feedback, and opportunities to improve performance through coaching and mentoring. Human Resource Development plays a central role in HUL's management philosophy. The company is widely known for its structured leadership pipeline. Young management trainees and graduate recruits are provided rotational assignments across departments and locations. These assignments help employees understand multiple business functions and develop broader managerial capabilities. Training programmes are designed to strengthen analytical ability, problem-solving, communication, decision-making, and leadership competencies. HUL also invests in continuous learning through formal development workshops, digital learning platforms, mentoring systems, and on-the-job learning experiences. Senior leaders actively guide younger managers, helping them understand both strategic and operational dimensions of business management. Performance appraisal systems at HUL focus not only on results but also on behavioural competencies such as teamwork, initiative, adaptability, and ethical conduct. Another important dimension is employee engagement and inclusion. HUL has increasingly focused on diversity, inclusion, and employee well-being. By encouraging diverse perspectives and building a supportive work environment, the company seeks to improve innovation, commitment, and long-term retention. These practices demonstrate how organizational behaviour and human resource development can contribute directly to business effectiveness, leadership readiness, and sustainable organizational growth.			
A.	Using the case, analyze how organizational behaviour practices at HUL contribute to employee performance and organizational effectiveness.	20	L2	03
B.	Examine the Human Resource Development practices adopted by HUL. How do these practices help in developing future leaders and strengthening organizational capability?	20	L3	02

**SARDAR PATEL COLLEGE OF ENGINEERING**(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai - 400058**PREVIOUS SEMESTER EXAMINATION JULY 2026**Program: Civil Engineering *Final Year B. Tech* Duration: 3 hr.Course Code: PC-BTC 801

Maximum Points: 100

Course Name: Engineering Economics, Estimation & Costing

Semester: VIII

Notes:

Sem VIII 14/7/26

1. Q.1 is compulsory & attempt any four out of six remaining questions
2. Illustrate answer with neat sketches wherever required.
3. Make suitable assumptions where necessary and state them clearly.

Q. No.	Questions	Marks	BL	CO	Module No
1.	A. Prepare detailed & abstract estimate of the following items from the given fig.1. 1. Excavation for foundation 2. Sand filling in plinth 3. BBCC in foundations (1:4:8) 4. 1st class Brick work in foundation & plinth in cement mortar (1:6) 5. 1st class Brick work in superstructure (1:6) 6. 12 mm thick sagole cement plaster cm (1:4) 7. 2.5 cm thick damp proof coarse 8. R.C.C work (Chajja & Slab) 9. Teak wood doors & windows & ventilator 10. Mosaic tiles flooring	20	III	4,5	3,4,5
2	A. What are the particulars of a typical tender notice? B. What are the conditions of contract?	10+10	II	1,2	1
3	A. Explain depreciation. Discuss any four methods of depreciation with suitable examples. B. Discuss the following terms with examples Book value Salvage value Scrap value Market value Capitalized value	10+10	II	4,5	3,5
4	A. Explain the procedure for preparing a detailed estimate of a residential building with a neat flow chart.	12+08	II	4,5	3,5



	B. Prepare rate analysis for the following item of work: Cement concrete in foundation 1:4:8 - unit 1 cu.m Assume materials and labor in the market rate.				
5	A. Workout the quantity of 6 mm, 10 mm, 16 mm diameter reinforcement for rectangular beam of size 230 mm x 500 mm. The beam is reinforced with 2 Nos - 10 mm dia at top, 2 Nos - 16 mm dia at bottom, 2 Nos - 16 mm dia bent up. 6 mm diameter two legged stirrups are provided with 150 mm c/c throughout the length. Length of the beam is 4.5 m. Assume suitable cover. Also prepare BBS. B. Illustrate a detailed about Labour Contract and Material Contract	12+08	II	4,5	3,5
6	A. Define valuation. Explain briefly the valuation methods. B. Discuss all the types tender in detail.	10+10	I,II	5	6
7	A. Mahagenco wish to construct new generation unit of 400 MW. Prepare tender notice specifying the cost of the project Rs.170 Cr. And 18 months duration. B. Estimate the materials required for 100 m ³ M20 concrete using nominal mix assumptions.	08+12	III	04	4,7

Rate Analysis Chart

Sr. No.	Item	Per	Rate
1	Excavation		
2	BBCC	Cu.m	200.00
3	1 st class brickwork	Cu.m	3000.00
4	2 nd class brickwork	Cu.m	3500.00
5	Cut cement pointing, plastering, centering work for beam/column, DPC	Sq.m	200.00
6	Teak wood door/window	Sq.m	5500.00
7	Mosaic tile flooring	Sq.m	500.00
8	RCC	Sq.m	1500.00
9	HYSD steel bars & Mild steel	Kg	65.00
10	Head mason	day	450
11	Mason	day	350
12	Majdoor	day	200
13	Bhisti	day	200
14	Assume water charges & Contractor profit (5%)		



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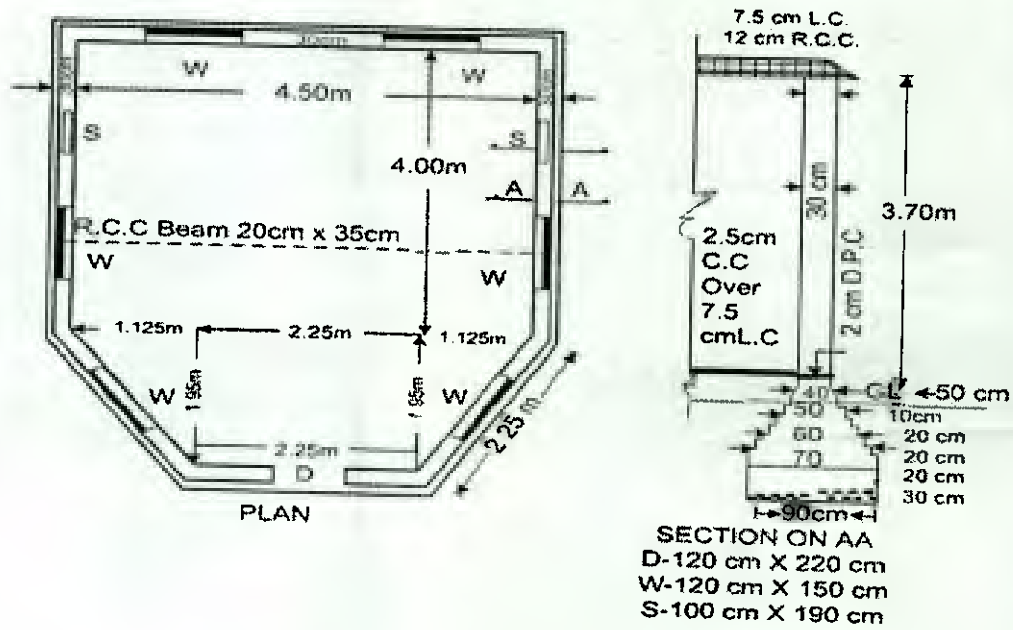


FIG: 1



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PREVIOUS SEMESTER EXAMINATION JULY 2026

Program: Final Year B. Tech Civil Engineering

Duration: 3 Hrs.

Course Code: PE-BTC824

Maximum Points: 100

Course Name: Finite Element Analysis [R18]

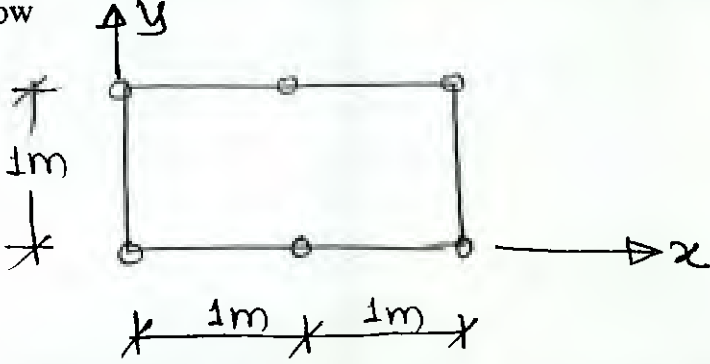
Semester: VIII

Sem VIII

15/4/26

Instructions for the Students:

1. Attempt any 05 (FIVE) questions
2. Assume suitable data if necessary and state it clearly.
3. Illustrate your answers with neat sketches wherever required.

Q. No.	Questions	Points	CO	BL	Module No.
1 a	Explain the following terms: i. Convergence, ii. Compatibility requirements iii. Geometric invariance.	10	1	2	2
1 b	Determine the interpolation functions for the element as shown in the figure below 	10	2	4	3
2 a	Derive a stiffness matrix for a CST element having joint coordinates as follows: Node 1 (2m, 2m), Node 2 (2m, 1m), Node 3 (1m, 2 m). Assume the element as plane stress element with thickness of 0.020 m, $E = 200$ GPa and $\nu = 0.2$.	10	2	4	3.5
2 b	For the simply supported beam subjected to uniformly distributed load acting over entire span, determine the maximum displacement using finite difference approach.	10	1,2	4	1

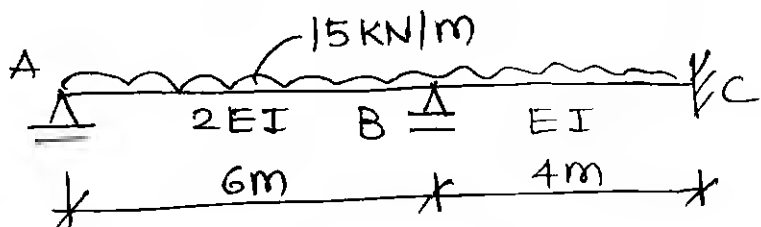
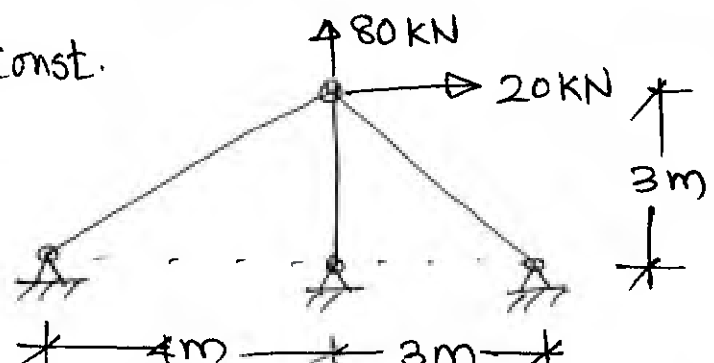


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PREVIOUS SEMESTER EXAMINATION JULY 2026

3 a	Determine the nodal load vector for a four noded rectangular element of size 1 m in X direction and 1 m in Y direction. Note that the element is subjected to a concentrated load of 50 kN in X direction and 30 kN in Y direction, both loads acting at point B. Note that distance of point B measured from left bottom corner node is 0.5 m along X direction and 0.3 m along Y direction.	10	2	4	3,5
3 b	For the element shown in Q3a, if the joint displacements for the top left and top right nodes are 0.005m, -0.002m in x direction respectively and -0.008m, 0.001m in y direction respectively, determine element stresses and element strains at a point (0.2m, 0.2m). Take $E = 200$ GPa and $\nu = 0.2$ and assume element in plane strain. Note that displacement at all other joints is zero.	10	2	4	3,6
4	For the continuous beam shown in figure below, using finite element techniques, determine element stiffness matrix, structure stiffness matrix, effective structure stiffness matrix, loading vector, displacement vector and member forces. 	20	1,2	4	3,4
5	For the truss shown in figure below, using finite element techniques, determine member stiffness matrix, structure stiffness matrix, effective structure stiffness matrix, loading vector, displacement vector, element forces and vector of element stresses and strains. $EA = \text{Const.}$ 	20	1,2	4	3,4

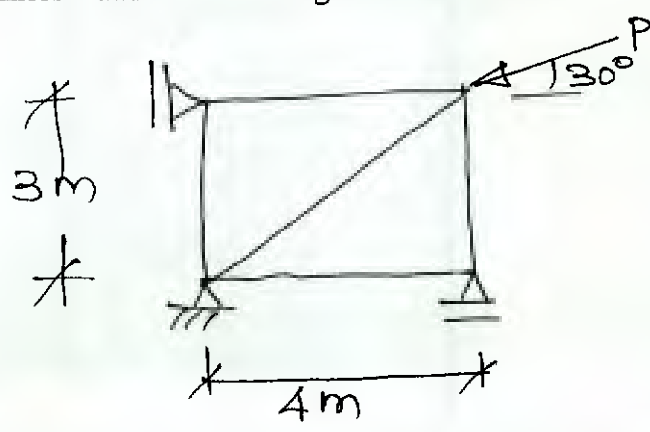


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PREVIOUS SEMESTER EXAMINATION JULY 2026

6	For the truss shown in figure 7, using finite element techniques, determine member stiffness matrix, structure stiffness matrix, geometric stiffness matrix and buckling load for the truss. 	20	1,2	4	3,6
7	For the Fixed beam of span 6m, using finite element techniques, determine member stiffness matrix, structure stiffness matrix, consistent mass matrix and first two natural frequencies. Take the density of material as 7850 kg/m^3 and EI value as 50000 kN-m^2. Consider 2 elements for modelling of a fixed beam.	20	1,2	4	3,7



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Previous Semester Exam – July 2026 Examinations

Program: B.Tech Civil Engg. *Final Year*
Course Code: PE-BTC822
Course Name: Bridge Engineering

Duration: 3 Hours
Maximum Points: 100
Semester: VIII

Sem VIII

16/7/26

- Notes: 1) Attempt any 5 main questions
2) Assume suitable data if missing and mention the same clearly
3) Draw neat sketches wherever possible
4) Use of IRC 6, IRC 112 and IS 800 is permissible

Q.No.	Questions	Points	CO	BL	Module
1	Design an RC slab culvert for a clear span of 5.5m and a carriageway of 9m. Wearing coat is of 65mm thickness. Consider single train of IRC Class 70R tracked vehicle loading. SIDL = 5kN/m ² . Use M35 and Fe500	20	1,4	4	3
2	For the steel truss with following details : Total span = 30m The total dead load per nodal point = 200kN Deck width = 8m Determine the suitable configuration of truss and design the top chord member for a footover bridge. Use E250 steel	20	4	4	5
3.a)	What are different parameters influences the 'impact factor' which is used to account dynamic effect of imposed load for roadway bridges? Calculate Impact factor for A PSC bridge of span 45m is to be designed to carry IRC Class A vehicle.	06	1,3	2	2,4
3.b)	A simply supported bridge span of 32m is supported on a single fixed (FX) and free bearing (FR) at each end. The width of carriageway is 8.5m. Calculate the braking forces for Class A wheeled vehicle plying on the span. If the reaction from dead load on each bearing is 1650kN, what are the longitudinal forces on the bearings? (<i>Assume that the supports are unyielding, $\mu=0.05$</i>)	07	1,3	2	2
3.c)	Explain in detail, the data to be collected for planning a bridge location.	07	3	2	1
4.a)	Explain the different cases of loading and load combinations for design of bridge superstructure and substructure	10	1	2	2,4
4.b)	Evaluate the axial load and moment carrying capacity for a pier having following data Size 1000mm x 1000mm Reinforcement on each face = 5nos-32mm dia(each face) Effective cover = 60mm Assume N.A = 350mm from extreme compression fibre Concrete grade is M45 and steel grade is Fe500.	10	4	4	6
5.a)	Obtain the maximum bending moment and maximum shear force for a girder of span 19m subjected to a single class A wheeled vehicle and having a courbon factor of 0.35	07	1	4	3

5.b)	Design an RCC girder of span 19m as per IRC 112 with following specifications: UDL on girder due to footpath and crash barrier = 10kN/m UDL on girder due to wearing course = 3kN/m Live load as per Q.6(a) Effective slab width as beam flange = 3m Depth of slab = 0.25m Use M40 and Fe500	13	4	4	3
6	Design a shallow foundation as per IRC 112 for a pier of size 1.25m x 1.25m. The design axial load = 2400kN and design moment along transverse axis = 1500kNm. SBC of soil = 100kN/m². Use M35 and Fe500 Provide checks for a) Flexure b) One way shear c) Punching shear at distance 2 x depth of footing from face of pier and at face of pier	20	4	4	6
7.a)	Enlist the various methods for construction of bridges. Explain in detail the steps involved in construction of cable stayed bridges and its impacts on design consideration.	10	4	4	7
7.b)	Explain in detail the points to be followed for good bridge aesthetics	10	3	2	1