QP-208

Seat No. CE-2nd - Sem-3rd

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Building Constructions & Materials

Sub. Code: 73201

Day and Date: MAY ,13-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:30 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Figures to the right indicate full marks
3. Use Sketches/Diagrams wherever necessary

Special Inst.: 1) Section I: Solve any three questions.
2) Section II : Q.5 and Q.6 compulsory. Solve any one question from Q.7 & Q.8

Q1) SECTION-I [11]

a) What are the essential constituents of good brick earth? How is the quality of brick affected by the excess of one or other of the constituents? (6)

b) What are the characteristics of good timber? What are the common uses of timber in building industry? (5)

Q2) a) List out types of shallow foundations and write suitability of each foundation. (6) [12]

b) What is form work? What are the characteristics of good form work? (6)

Q3) a) Enlist different types of bonds in brick masonry. Draw neat sketches of any two bond types. (6) [11]

b) What are factors to be considered for the selection of stone for stone masonry? (5)

Q4) Write short note on: [12]

i) Seasoning of Timber

ii) Dressing of stone

iii) Pile Foundation

Q5) SECTION II [12]

Draw sectional plan and Elevation of a T.W. Framed 2 paneled door with following data :

a) Clear opening : 750 X 2100 mm

b) Frame Size: 75 X 125 mm;

c) No. of Shutter : 01

Assume suitable data.

Q6) Design and draw the plan and sectional elevation of R.C.C. Dog legged stair case for public building for following data- [18]

a) Storey height -3.50 m ;

b) width of stair – 1.40m

Q7) What are the requirements of good building staircase? [5]

Q8) Enlist the various roof coverings which are generally used for pitched roofs in India. [5]

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Seat No. CE-3rd Sem-3rd. Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Surveying-I

Sub. Code: 73198/77770

Day and Date: MAY ,04-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Figures to the right indicate full marks
3. Use of Scientific calculator is allowed

Special Inst.: Attempt Any Three questions from question number 1 to question number 4.
Attempt Any Three questions from question number 5 to question number 8.

Q1) a) Define Level line , horizontal line and vertical line with neat sketch (06) **[12]**

b) Explain Reciprocal Levelling in detail with neat sketch (06)

Q2) a) Explain Simpsons rule with neat sketch for area calculation (05) **[11]**

b) Explain trapezoidal rule with neat sketch for area calculation (06)

Q3) a) Describe orientation by magnetic needle method (05) **[11]**

b) What are advantages and disadvantages of plane table surveying (06)

Q4) Attempt any **three** questions from the following . **[12]**

a) Write note on characteristics of contours (04)

b) Write various usage of contour maps (04)

c) Explain factors affecting sensitivity of bubble tube (04)

d) Write short note on Area of zero circle.(04)

e) Explain Radiation method in plane table survey (04)

Q5) a) Explain procedure of measuring vertical angles with theodolite (06) **[12]**

b) What are temporary adjustments of Vernier Theodolite (06)

Q6) a) The following records are obtained in a traverse survey,where the length and bearing of the last line were not recorded. **[11]**

LINE	LENGTH IN [M]	BEARING
AB	75.50	30°24'
BC	180.50	110°36'
CD	60.25	210°30'
DA	?	?

Compute the length and bearing of line DA. (08)

b) Explain Bowditch rule (03)

Q7) a) What are various usage of ghat tracer (05) [11]
b) What are various usage of abney level and hand level (06)

Q8) Attempt any **three** questions from the following , [12]
a) Write note on Hydrographic surveying (04)
b) Explain Latitude and Departure (04)
c) Write note on Tunnel surveying (04)
d) Explain usage of Box sextant (04)
e) Explane usage of Theodolite (04)

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QP-171

Seat No. CE -

Total No. of Pages : 3

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Engineering Maths - III

Sub. Code: 63338/73197

Day and Date: MAY ,03-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:

Special Inst.: 1)Attempt any three questions from each section.
2)Use of non-programmable calculator is allowed.
3)Figures to the right indicates full marks.

SECTION-I

Q1) **Solve the following.** [12]

a) Solve $(D^2+4D+4)y=\cosh 2x$ [6]

b) Solve $(D^2+2D+2)\, y=(x^2+1)$ [6]

Q2) **Solve the following.** [11]

a) Find the directional derivative of $\phi = x^2 - y^2 - 2z^2$ at the point $P(2,-1,3)$ in the direction $\overline{PQ}$ where $Q(5,6,4)$. [5]

b) Show that the vector field given by, $\bar{F} = (6xy+z^3)i + (3x^2-z)j + (3xz^2-y)k$ is irrotational. Also find the scalar potential $\emptyset$ such that $\nabla\emptyset = \bar{F}$ [6]

Q3) **Solve the following.** [11]

a) Fit a straight line to the following data. [5]

X	1	2	3	4	5
y	14	27	40	55	68

b) Find the line of regression of y on x for the following data. [6]

X	10	12	13	16	17	20	25
y	19	22	24	27	29	33	37

Q4) **Attempt any two from the following.** [12]

a) Solve $x^2\frac{d^2y}{dx^2} - 2x\frac{dy}{dx} - 4y = x^2 + 2\log x$. [6]

b) If $\bar{F} = x^2zi - 2y^3z^2j + xy^2zk$, find divergence and curl of $\bar{F}$ at $(1,-1,1)$. [6]

c) The two regression equations of the variables x and y are, $x = 19.13 - 0.87y$ and $y = 11.64 - 0.50x$. Find $\bar{x}$, $\bar{y}$ and the coefficient of correlation between x and y. [6]

Q5) SECTION-II [12]

P.T.O.

Solve the following:

a) A random variable X has the following probability distribution.

X	0	1	2	3	4	5	6	7	8
P(X)	0	3a	5a	7a	9a	11a	13a	15a	17a

Determine: (i) Value of a; (ii) $P(X<3)$, $P(X>3)$, $P(0<X\leq 5)$ [6]

b) If the probability that an individual suffers a bad reaction from a certain injection is 0.001, determine the probability that out of 2000 individuals

(i) Exactly 3; (ii) more than 2 individuals. [6]

Q6) Solve the following: [11]

a) Find the Laplace transform of $\cosh 2t \cdot \cos 2t$ [5]

b) Evaluate using Laplace transform $\int_0^\infty e^{-3t} t \cdot \sin t \, dt$ [6]

Q7) Solve the following: [11]

a) Evaluate $\int_{-1}^{1} \frac{dx}{1+x^2}$ using Trapezoidal rule by dividing the interval into 8 sub intervals. [5]

b) Using Simpson's $(\frac{1}{3})^{rd}$ rule to obtain value of the $\int_1^2 \frac{dx}{x}$ taking 10 equal interval. [6]

Q8) Attempt any TWO from the following: [12]

a) The lifetime of certain type of battery has mean life of 400hrs. and a standard deviation is 50 hrs. Assuming the distribution of lifetime to be normal, find

i) The percentage of batteries which have lifetime of more than 350 hrs.
ii) The percentage of batteries which have lifetime between 300 and 500hrs.
(Given S.N.V.Z. are between $z=0$ and $z=1$ is 0.3413, between $z=0$ and $z=2$ is 0.4772) [6]

b) Find inverse Laplace transform of $\frac{2s+2}{(s+1)^2(s+2)}$ [6]

c) Find the value of the integral using Simpson's $(\frac{3}{8})^{th}$ rule $\int_0^\pi (x - \cos x) dx$ by dividing the interval into 6 sub intervals. [6]

QP-350

Seat No. CE-2nd Gen 3rd

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Fluid Mech-I

Sub. Code: 63341/73200/77772

Day and Date: MAY ,11-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Figures to the right indicate full marks

Special Inst.: Q4 and Q8 are compulsory
Attempt any three questions from each section

Q1) SOLVE THE FOLLOWING [11]

1. Explain the properties Viscosity and Surface Tension with their SI Unit [5]

2. A plate 0.05 mm distant from a fixed plate moves at 1.2 m/s and requires a shear stress of 2.2 N/m^2 to maintain this speed. Find the viscosity of the fluid between the plates. [6]

Q2) SOLVE THE FOLLOWING [12]

A. Derive formula for Total Pressure and Centre of Pressure for Plane vertical surface immersed into liquid. [6]

B. A 1m wide and 1.5 m deep rectangular plane surface lies in water in such a way that its plane makes an angle of 30° with the free water surface. Determine the total pressure and position of centre of pressure when the upper edge is 0.75 m below the free water surface. [6]

Q3) SOLVE THE FOLLOWING [11]

A. Explain various types of Flows [5]

B. For the stream functions $\Psi = 3x^2y - y^3$, calculate velocity at a point (1, 2) [6]

Q4) Write a short Note on (Attempt Any Three) [12]

A. Capillary Effect [4]

B. Types of Pressure [4]

C. Pressure Diagram [4]

D. Flow Net (Properties and Uses) [4]

E. Stability Conditions of submerged Bodies [4]

Q5) SOLVE THE FOLLOWING [11]

A. Write Bernoulli's Theorem Limitations and modifications [5]

B. Example 6.34. A 200 mm × 100 mm venturimeter is provided in a vertical pipe carrying water, flowing in the upward direction. A differential mercury manometer connected to the inlet and throat gives a reading of 220 mm. Find the rate of flow. Assume Cd = 0.98. [6]

Q6) SOLVE THE FOLLOWING [12]

A. Explain Hydraulically Smooth and Rough Boundaries [6]

B. Water flowing through a 2 cm dia pipe. The shear stress at a point 4 mm from the axis is 0.1 N/cm^2 Assuming flow to be viscous Calculate shear stress at Pipe wall [6]

Q7) SOLVE THE FOLLOWING [11]

A. What do you mean by Concept of Equivalent Pipe [5]

B. Three pipes of diameters 300 mm, 200 mm and 400 mm and lengths 450 m, 255 m and 315 m respectively are connected in series. The difference in water surface levels in two tanks is 18 m. Determine the rate of flow of water if coefficients of friction are 0·0075, 0·0078 and 0·0072 respectively Neglecting minor losses. [6]

Q8) Write a Short Note on (Attempt Any Three) [12]

A. Concept of HGL and TEL [4]

B. Laminar Flow and Turbulent Flow [4]

C. Surge Tank and its Uses [4]

D. Seperation of Boundary Layer [4]

E. Major and Minor Losses [4]

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Seat No. CE-2nd Sem-3rd. Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Strength Of Material-I

Sub. Code: 63340/73199/77771

Day and Date: MAY ,09-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labbelet diagrams wherever necessary
3. Figures to the right indicate full marks
4. Use of Scientific calculator is allowed

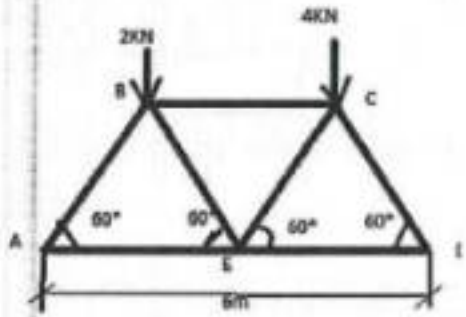
Special Inst.: Q1 and Q5 are compulsory
Solve any two from Q2 to Q4 and Q6 to Q8 respectively

Q1) a) Derive the relation between Young's Modulus and Bulk Modulus. (03) [9]
b) Explain point of zero shear force and point of contra flexure. (03)
c) Differentiate between method of joint and method of section. (03)

Q2) A square RCC column is 300mm x 300mm in cross section . It is reinforced with 4 bars of 20mm diameter . Determine the load carrying capacity of the column if allowable stresses in concrete and steel are 7MPa and 140MPa respectively. Es=200GPa and modular ratio m=13. [13]

Q3) Draw SFD and BMD for a beam ABCD with A as free end , hinge support at B , internal hinge at C and fixed support at D. Span AB is 1m , BC is 3m and CD is 2m. The beam is subjected to udl of 15KN/m over entire span. Also find location of point of contra flexure and maximum bending moment and calculate magnitude of maximum bending moment. [13]

Q4) Analyse the truss by using method of joint. [13]



Q5) a)Draw shear stress distribution of rectangular , I-section and T- section. **(03)** **[9]**
b) State assumptions made in theory of simple bending. **(03)**
c)Define : i) Strain energy, ii) Modulus of resilance **(03)**

Q6) A cast iron beam of C-section with top flange 150mm x 15mm , bottom flange 200mm x 20mm and web 15mm x 200mm is supported over a span of 6m . If the permissible stresses are 120MPa compression. What udl can be safely applied on beam . What will be tensile stress in beam. **[13]**

Q7) Draw shear stress distribution on a T-section with web 150mm x 15mm deep and flange 200 mmx 20mm wide. The section id symmetric at vertical axis. The shear force applied is 110KN. **[13]**

Q8) Determine the instantaneous stress and deformation of a rod of length 1m and diameter 6mm , if a mass of 50kg falls through a height of 10cm and strikes the bottom of rod . The rod is freely suspended and fixed at the top. Assume E= 210GPa. **[13]**

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Seat No. CE. 2nd Sem 4th

Total No. of Pages : 3

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Building Design and Drawing

Sub. Code: 63348/79116/79404

Day and Date: MAY ,15-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:30 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labbelet diagrams wherever necessary
3. Figures to the right indicate full marks

Special Inst.: 1) Attempt any two questions from Que. 1 , Que. 3 and Que.4
2) Attempt any two questions from Que. 5 , Que. 6 and Que. 7
3) Que. no. 2 and Que. no. 8 are compulsory.

Q1) Attempt all questions [7]

1. Explain the various factors to be considered in selection of good site for residential building. [3]

2. List out the principles of planning & explain 'Prospect' as a principle of planning a building. [4]

OR

Explain the significance of sun diagram with neat sketch.

Q2) Attempt compulsory [21]

1. A residential bungalow (G+ 1) for consulting Architect is to be constructed on a plot having size 20m x 28m. Plot width 20 m facing on 9.0m wide road on East side. Design bungalow for following data : [21]
   i. Office with toilet :1
   ii. Living Room : 1
   iii. Kitchen cum Dinning : 1
   iv. Store room : 1
   v. Utility : 1
   vi. Master Bed Room with attach toilet : 2 Nos
   vii. Children Bed Room : 1
   viii. Guest Bed Room : 1
   ix. Staircase
   x. Sanitary Block as per requirement

   The necessary verandah, porch should be provided in the design.

Show North Direction and write construction notes
Draw with the scale 1:100

1. Draw detail plan of Ground Floor
2. Draw detail plan of First Floor
3. Give Area Statement.

Q3) Attempt all questions [7]

1. Describe various materials of Low-Cost Housing. [3]

2. Explain importance of Green Building. [4]

OR

Explain types of maintenance job of a building.

Q4) Attempt all questions [7]

1. Explain concept Repairs & Rehabilitation of structures. [4]

OR

Explain Green building rating systems in India.

2. Write a note on " Privacy" as a principle of planning a building [3]

Q5) Attempt all questions [12]

1. Explain in detail various systems of plumbing for drainage. [6]

2. Write in detail concept of Rainwater Harvesting. [6]

Q6) Attempt all questions [12]

1. Write in detail Classification of Air conditioning with neat sketches. [6]

2. What are the systems of ventilation? Differentiate between artificial and natural ventilation. [6]

Q7) Attempt all questions [12]

1. Explain the various types of Pointing with sketches. [6]

2. Enlist the various types of Paints and write its application methods. [6]

Q8) Attempt compulsory [11]

1. Short note on materials used for thermal Insulation. [3]

2. Define Plastering & give objective of plastering. [4]

3. Explain various Fire resisting materials. [4]

OR

Short note on types of Wiring

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Seat No. CE-2nd

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Surveying-II

Sub. Code: 63345/79113/79401

Day and Date: MAY ,09-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Figures to the right indicate full marks
3. Use of Scientific calculator is allowed

Special Inst.: Attempt any three question from question number 1 to question number 4 attempt any three questions from question number 5 to question number 8

Q1) a) What are the methods of determining Tacheometric Constants. Explain any one with a neat sketch (06) **[12]**
b) Two horizontal distances of 50 m and 80 m were accurately measured and the intercepts on the staff between the outer stadia wires were 0.496 m and 0.796 m respectively. Calculate the tachometric constants (06)

Q2) a)Explain classification of signals.(05) **[11]**
b) Explain with neat sketch Triangulation Figures.(06)

Q3) a) Explain in brief reconnaissance, preliminary surveys for road project (05) **[11]**
b) Explain Total Station with neat sketch (06)

Q4) Attempt any three from the following **[12]**
a) Explain classification of Triangulation. (04)
b) Write a short note on EDM.(04)
c) Explain Stadia Method.(04)
d) Explain in brief auto reduction tacheometer. (04)

Q5) a) Draw neat sketch of simple circular curve and explain its notations (06) **[12]**
b) Two tangents AB & BC intersect at point B at 150.5m chainage, let us calculate all the necessary data for setting out circular curve of 100m radius and deflection angle 30^{0} by the method of offsets from the long chord. (06)

Q6) a) Explain flight planning in detail (05) **[11]**
b) Explain scale of vertical photographs with neat sketch (06)

Q7) a) Explain applications of GIS in civil engineering (05) **[11]**
b) Explain applications of GPS in civil engineering (06)

Q8) Write short note on any three from the following **[12]**

a) Remote sensing (04)
b) Vertical curve (04)
c) Transition curve (04)
d) Photo-theodolite (04)

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QP-238

Seat No. CE- 2nd Sem.-4th.

Total No. of Pages : 3

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Concrete Technology

Sub. Code: 63346/79114/79402

Day and Date: MAY ,11-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever necessary
4. Figures to the right indicate full marks
5. Use of Scientific calculator is allowed

Q1) Attempt all questions. **[12]**

A. Explain the initial and final setting time test on cement. **[6]**

B. Explain the phenomenon of bulking of sand. **[6]**

Q2) Attempt the following. **[11]**

A. Explain the various methods of curing of concrete. **[6]**

B. What is mean by segregation and bleeding? Explain their importance in concrete. **[5]**

Q3) Attempt any Two. **[12]**

A. Explain in detail Schmidt's Rebound Hammer test on concrete with their limitation. **[6]**

B. Explain how w/c ratio and aggregate/cement ratio influence on workability of fresh concrete. **[6]**

C. What is creep and shrinkage of concrete? List the factors affecting creep and shrinkage of concrete. **[6]**

Q4) Attempt all questions **[15]**

A. What are the factors affecting design of concrete mix. **[5]**

B.

Design of M20 concrete mix as per IS:10262-2009 [10]

1. Grade Designation: M20
2. Type of cement: OPC 43 grade confirming to IS 8112
3. Maximum nominal size of aggregate: 20 mm
4. Workability: 100 mm slump
5. Exposure condition: Mild for R.C.C.
6. Specific gravity of cement: 3.15
7. Specific gravity of coarse aggregates: 2.8
8. Specific gravity of fine aggregates: 2.7
9. Sieve analysis of fine aggregate: Confirming to Zone I of IS: 383

Table1 : Assumed Standard Deviation

Sr. No.	Nominal size of Aggregate	Assumed standard deviation in N/mm²
1.	M 10	3.50
2.	M 15	
3.	M 20	4.00
4.	M 25	
5.	M 30	5.00
6.	M 35	
7.	M 40	
8.	M 45	
9.	M 50	

Table 2 : Maximum Water Content per Cubic Metre of Concrete for Nominal Maximum Size of Aggregate

Sr. No.	Nominal Maximum Size of Aggregate	Maximum Water Content Kg
1	10	208
2	20	186
3	40	165

Table 3 : Volume of Coarse Aggregate per Unit Volume of Total Aggregate for Different Zones of Fine Aggregate

Sr. No.	Nominal Maximum Size of Aggregate	Zone IV	Zone III	Zone II	Zone I
1	10	0.50	0.48	0.46	0.44
2	20	0.66	0.64	0.62	0.60
3	40	0.75	0.73	0.71	0.69

Table 5 : Maximum cement content, Maximum Water cement ratio and Minimum grade of concrete for Different exposures with Normal Weight aggregates of 20 mm Nominal Maximum size

Sr. No	Exposure	Plain Concrete			Reinforced concrete		
		Maximum Cement content Kg/m³	Maximum free Water-cement ratio	Minimum grade of concrete	Maximum Cement content Kg/m³	Maximum free water-cement ratio	Minimum grade of concrete
1	Mild	220	0.60	-	300	0.55	M20
2	Moderate	240	0.60	M15	300	0.50	M25
3	Severe	250	0.50	M20	320	0.45	M30
4	Very Severe	260	0.45	M20	340	0.45	M35
5	Extreme	280	0.40	M25	360	0.40	M40

P.T.O.

Q5) Attempt any two. [8]

A. What do you mean by Mineral Admixture? Explain in detail Fly ash? [4]

B. Describe the mechanism of action of plasticizers. [4]

C. Explain use metakaolin in fresh concrete with their advantages. [4]

Q6) Attempt any two. [12]

A. Write short notes on a) Self compacting concrete b) High performance concrete. [6]

B. Explain Acid attack on concrete. [6]

C. Explain sulphate attack on concrete in detail. [6]

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Seat No. CE-2nd Sem-4th. Total No. of Pages : 3

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Fluid Mechanics-II

Sub. Code: 63347/79115/79403

Day and Date: MAY ,13-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labbelet diagrams wherever necessary
3. Figures to the right indicate full marks

Special Inst.: Q4 and Q8 are compulsory
Attempt any TWO questions from Q1,Q2,Q3
Attempt any TWO questions from Q5,Q6,Q7

Q1) Solve the following **[11]**

A. Enlist Types of flow in open channel. What do you understand by Uniform and non-uniform flow ? **[5]**

B. Find the discharge through a rectangular channel of width 2 m, having a bed slope of 4 in 8000. The depth of flow is 1.5 m. Take n=0.15 **[6]**

Q2) Solve the following **[12]**

A. Sketch and Explain following GVF Profiles
H2 Profile and C1 Profile **[6]**

B. A channel of rectangular section 6m wide has a uniform depth of flow of 1.8 m. The bed slope of 1 in 3600. The water surface at the particular section is raised by 1.2 m due to the weir constructed at the down end of the channel. Determine the water surface slope with respect to horizontal. Take n= 0.02 , Also mention profile **[6]**

Q3) Solve the following **[11]**

A. Define hydraulic jump and state its types and applications **[5]**

B. The depth of flow of water at a certain section of a rectangular channel of 2 m wide is 0.3 m. The discharge through the channel is 1.5 m3/sec. Determine whether a hydraulic jump will occur, and if so find its height and loss of energy. **[6]**

Q4) Write a short note on (Attempt Any Three) **[12]**

A. Open channel flow and Pipe flow [4]

B. Specific Energy curve with neat sketch [4]

C. Spatially Varied Flow [4]

D. Gradually Varied Flow and Rapidly Varied Flow [4]

E. Positive and Negative Surge [4]

Q5) Solve the following [11]

A. Derive the expression for Discharge over a rectangular weir or Notch [5]

B. Water flows in a rectangular channel of 2m wide and 0.9 m deep. Find the discharge over a rectangular weir of crest length 100cm, if the head over the crest is 20 cm. Take Cd= 0.62 [6]

Q6) Solve the following [12]

A. Derive the force exerted on a flat moving plate, jet impacting normally [6]

B. A nozzle of 50 mm diameter delivers a stream of water at 20 m/s perpendicular to plate the and moves away from a jet at 5 m/s, Find the Force on plate and Work done [6]

Q7) Solve the following [11]

A. Draw a neat sketch of Francis turbine and explain working of each component [5]

B. Explain selection of the turbine in detail [6]

Q8) Write a short note on (Attempt Any Three) [12]

A. End Contraction and Velocity of Approach [4]

B. Types of Netches and Weirs [4]

C. Impulse Momentum Principal [4]

D. Draft tube, Types and functions [4]

E. Cipolletti Weir [4]

QP-217

Seat No. CE-2-S-4th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Structural Mechanics

Sub. Code: 79112

Day and Date: MAY ,03-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Figures to the right indicate full marks

Special Inst.: Question no 1 and 5 are compulsory and solve any two out of remaining from each section

Q1) Solve following questions. [9]

a. Define Major principal planes and stresses also Minor principal planes and stresses. [3]

b. Establish the condition of no tension for Rectangular section. [3]

c. State uses of Influence line diagram. [3]

Q2) Direct stresses of 120 MPa in tension and 90 MPa in compression are applied to an elastic material at a certain point on planes at right angles to another .If the maximum principle stress is not to be exceed 150 MPa in tension . [13]

1. To what shear stress can material be subjected?
2. What is then the maximum resulting shear stress in the material?
3. Also find the magnitude of their other principle stress and its inclination to 120MPa.

Q3) A short hollow pier of 1.2 m square section outside and 1 m square section inside is subjected to a direct load of 100 kN along its midpoint of outer edge. Determine the final stresses at the base of the pier. Draw neat sketch of stress distribution diagram. [13]

Q4) A beam ACB 10 m long is fixed at A and is simply supported at B and is provided with an internal hinge at C 5 m from A. Draw the ILD for the following [13]

1. B.M. at A
2. Reaction at B
3. Reaction at A

Q5) Solve following questions. [9]

a. Explain limitation of Euler's formula for long column. [3]

b. Explain the suitability of Conjugate beam Method. [3]

c. Write the Torsion formula and its notations. [3]

Q6) A strut 2.5 m long is 60 mm in diameter. One end of the strut is fixed while other end is hinged. Find the safe compressive load for the member using Euler's formula, allowing a factor of safety 3.5. Take E = 2.1x 10^5 N/mm2. [13]

Q7) Using moment area method, derive the expression for the slope and deflection of cantilever beam loaded with UDL over whole span. Assume uniform flexural rigidity EI. [13]

Q8) A hollow shaft is to transmit 300 KW at 80 r.p.m . If the shear stress is not to be exceed 60 N/mm2 and internal diameter is 0.6 of the external diameter. Find the external diameter and internal diameters, assuming that the maximum torque is 1.4 times the mean. [13]

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Seat No. CE-3rd-Sem-5th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Water Resource Engineering-I

Sub. Code: 80763/81000

Day and Date: MAY ,10-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labbelet diagrams wherever necessary
3. Figures to the right indicate full marks
4. Use of Scientific calculator is allowed

Special Inst.: Q4 and Q8 are compulsory. In section I Attempt any two questions from Q1,Q2 and Q3 and in section II attempt any two questions from Q5, Q6 & Q7

Q1) a) Explain with sketch automatic type of rain gauge. (Tiping bucket type rain gauge) **[11]** (5)

b) Explain various methods of estimation of missing precipitation at a raingauge station (6)

Q2) a) What is Infiltration ? Explain factors affecting Infiltration ? (5) **[11]**

b) The rate of rainfall for successive 30 min. periods of a 4h storm are as follows(6)

3.5, 6.5,8.5,7.8,6.4,4.0,4.0,6 cm/h.

Taking the value of Ø index as 4.5cm/h, compute the following

a. Total rainfall

b. Total rainfall excess

c. W index

Q3) a) Explain various time parameters used in Hydrograph analysis (6) **[12]**

b) The ordinates of 6 H unit hydrograph are given, calculate ordinates of 3 hours unit hydrograph (6)

Time(h)	0	03	06	09	12	15	18	21	24	27	30	33	36	39	42
Ordinates (Cumecs)	0	9	20	35	49	43	35	28	22	17	12	9	6	3	0

Q4) **[12]**

a) Confined and Unconfined aquifer (6)

b) Bandhara Irrigation (6)

c) Assesment of Irrigation water (6)

Q5) a) Explain in detail with neat sketch. **[11]**

a) Aquifer b) Aquiclude c) Aquifuge d) Aquitard e) Perched Aquifer (5)

b) Explain in detail constructional features of open well.(6)

Q6) a) Explain in detail general layout, main components & functioning of Percolation tank.(5) [11]

b) Explain with neat sketch working of Drip Irrigation. State its advantages and disadvantages.(6)

Q7) a) What do you understand by consumptive use of water?(5) [12]

b) Define duty delta and base period ? What is difference between base period and crop period ? Write the releation between duty delta and base period ? (7)

Q8) Write short notes on: (Solve any two) [12]

a) Classes and availability of soil water (6)

b) Kolhapur type weir (6)

c) indian crop seasons and crop types (6)

* * *

QP-432

Seat No. CE - 3rd - Sem - 5th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Design of Steel Structures

Sub. Code: 66236/80764/81001

Day and Date: MAY ,14-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever necessary
4. Figures to the right indicate full marks
5. Use of Scientific calculator is allowed

Special Inst.: IS 800-2007 and steel table is allowed in Examination

Q1) Attempt all questions [7]

a. Explain stress strain curve of steel with neat sketch [3]

b. Differentiate between welded connections and bolted connections [4]

Q2) Design welded connection for an angle 80 x 50 x 8 mm connected to one side of gusset plate 12 mm thick by longer leg. Design the weld for full strength of above angle section. draw connection details. Consider field/site welding. [14]

Q3) Calculate design axial strength of angle 100x100x10mm angle connected to 10mm gusset plate. the yield and ultimate strength of steel is 250 and 410MPa. 10 bolts of 20mm diameter and 4.6 grade are used in single line for connection. [14]

Q4) Design a strut (Compression member) to carry factored compressive load of 280 kN. Use two angles connected back to back and draw the details .Take effective length = 4m.. [14]

Q5) Attempt all questions [7]

a. Differentiate between lacing and battening system [3]

b. What are the loads that act on gantry girder [4]

Q6) Design a slab base for a column ISHB350@710.24 having factored load 1000 kN The column. The base rests on concrete pedestal of grade M20. Assume the column is machined smooth for perfect bearing. Take SBC=250kN/m^2 [14]

Q7) Design a simply supported beam of effective span 4 m carrying a factored uniformly distributed load of 15 kN/m. The beam is laterally supported throughout. [14]

Q8) Calculate the design forces for a gantry girder to be used in an industrial building carrying a manually operated overhead traveling crane for the following data: **[14]**

- Crane capacity - 250kN
- Self-weight of the crane girder excluding trolley - 220kN
- Self-weight of the trolley, electric motor, hook, etc. - 60kN
- Approximate minimum approach of the crane hook to the gantry girder -15 m
- Wheel base - 3 m
- c/c distance between gantry rails - 15m
- c/c distance between columns (span of gantry girder) - 7.5 m
- Diameter of crane wheels - 150mm • Steel is of grade Fe 410

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QP-465

Seat No: CE-3-Sem-5

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Environmental Engineering-I

Sub. Code: 80765/81002

Day and Date: MAY ,15-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbeled diagrams wherever necessary
4. Figures to the right indicate full marks

Q1) Attempt all questions. [12]

a. Explain meaning and acceptable limits for following water quality parameters. [6]
i) Dissolved Oxygen ii) Hardness iii)Turbidity

b. Write a note on incremental increase method of population forecast. [6]

Q2) Attempt any Two. [11]

a. Write a note on Gravity aerator. [6]
OR
Design a rectangular settling tank to treat 2 MLD of water. Assume detention time of 3 hours and flow through velocity of 7.5 cm/min. If the depth of the tank is 3m, find the overflow rate and dimensions of the tank.

b. Explain the principle and working of Tube settler. [5]

Q3) Attempt any Two. [12]

a. Draw a flow diagram of a typical ground water treatment plant and explain function of each unit in brief. [8]

b. What is difference between disinfection and sterilization? Why disinfection is necessary. **OR** [4]
Explain the lime soda method of water softening? What are its advantages and disadvantages.

Q4) Attempt all questions. [12]

a. State the various types of corrosion. Explain cathodic protection for corrosion control in detail. [8]

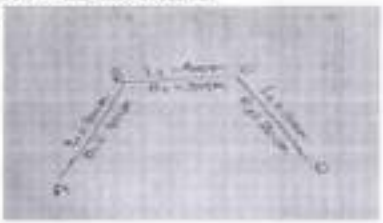
b. What is thrust block? Where is it provided? [4]

Q5) Attempt any Two. [11]

a. Find the equivalent length of 30 m diameter pipe for the network shown in figure using, [7]

i. Darcy's formula

ii. Hazen-William's formula



b. Differentiate between gravity, pumped and combined water distribution system with figures. [4]
OR
What are basic functional and hydraulic requirements of a water distribution system.

Q6) Attempt any Two. [12]

a. Sketch and explain i) Air valve ii) Sluice valve iii) Non return vale. [6]

b. Explain the procedure and importance of Leakage and pressure testing of newly laid water mains. [6]
OR
Explain necessity and importance of water audit in water supply system.

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Seat No. CE-3 Sem-5th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Environmental Engineering-I

Sub. Code: 80765/81002

Day and Date: MAY ,15-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever necessary
4. Figures to the right indicate full marks

Q1) Attempt all questions. [12]

a. Explain meaning and acceptable limits for following water quality parameters. [6]
i) Dissolved Oxygen ii) Hardness iii)Turbidity

b. Write a note on incremental increase method of population forecast. [6]

Q2) Attempt any Two. [11]

a. Write a note on Gravity aerator. [6]
OR
Design a rectangular settling tank to treat 2 MLD of water. Assume detention time of 3 hours and flow through velocity of 7.5 cm/min. If the depth of the tank is 3m, find the overflow rate and dimensions of the tank.

b. Explain the principle and working of Tube settler. [5]

Q3) Attempt any Two. [12]

a. Draw a flow diagram of a typical ground water treatment plant and explain function of each unit in brief. [8]

b. What is difference between disinfection and sterilization? Why disinfection is necessary. **OR** [4]
Explain the lime soda method of water softening? What are its advantages and disadvantages.

Q4) Attempt all questions. [12]

a. State the various types of corrosion. Explain cathodic protection for corrosion control in detail. [8]

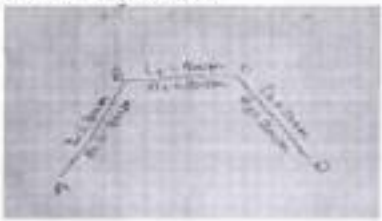
b. What is thrust block? Where is it provided? [4]

Q5) Attempt any Two. [11]

a. Find the equivalent length of 30 m diameter pipe for the network shown in figure using. [7]

i. Darcy's formula

ii. Hazen-William's formula



b. Differentiate between gravity, pumped and combined water distribution system with figures. **OR** [4]
What are basic functional and hydraulic requirements of a water distribution system.

Q6) Attempt any Two. [12]

a. Sketch and explain i) Air valve ii) Sluice valve iii) Non return vale. [6]

b. Explain the procedure and importance of Leakage and pressure testing of newly laid water mains. **OR** [6]
Explain necessity and importance of water audit in water supply system.

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Seat No. CE-BTech-Sem-6th

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Geotechnical Engineering - I

Sub. Code: 80766/81003

Day and Date: MAY ,16-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Figures to the right indicate full marks
4. Use of Scientific calculator is allowed

Q1) Attempt any two questions **[12]**

a. How gradation curve is drawn? Define Cc and Cu **[6]**

b. Explain with sketch phase diagrams for the partially saturated soil and dry soil **[6]**

c. Explain IS soil classification system **[6]**

Q2) Attempt any two questions **[12]**

a. Discuss various factors affecting permeability of soil **[6]**

b. Explain laboratory method for determination of coefficient of permeability for coarse grained soil with equation and sketch **[6]**

c. A stratum of soil consist of three layers of equal thickness the permeability of top and bottom layer are 1x10-4 cm/sec and that od middle layer is 1x10-3 cm/sec. Find out value of horizontal permeability for entire soil sample **[6]**

Q3) Attempt following questions **[11]**

a. Differentiate between compaction and consolidation **[6]**

b. List types of compaction equipment's and their suitability **[5]**

Q4) Attempt any two questions **[12]**

a. Discuss Equivalent point load method **[6]**

b. Explain Newmarks chart and its application **[6]**

c. Determine the vertical stress at a point P which is 3m below and at a vertical **[6]**

distance of 3m from the vertical load of 100KN. Use Westergards equation

Q5) Attempt following questions [11]

a. Explain triaxial shear test with merits and demerits. [5]

b. Determine the shear strength of soil in terms of effective stress on a plane within a saturated soil mass at a point where the total stress 220KN/M2 and pore water pressure is 120KN/M2. The effective strength parameters are C=6KN/M2, ϕ=30° [6]

Q6) Attempt any two questions [12]

a. A retaining wall 7m high retains dry sand with an angle of internal friction of 30degrees and unit weight of 17.5kN/cum. Determine active and passive earth pressure acting on wall [6]

b. Differentiate between Rankine's and Coulombs theories of earth pressure [6]

c. State the relationship between active, passive and at rest pressure including its applications [6]

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Seat No. CE-2nd-Sem-5th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Waste Management

Sub. Code: 80939/81006

Day and Date: MAY ,20-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. All questions are compulsory
2. Draw neat labbelet diagrams wherever necessary
3. Figures to the right indicate full marks

Q1) [11]

SECTION I

Attempt all the questions.

a. Write down the properties of waste in detail. (5)

b.Explain the various acts & rules for waste in India. (6)

Q2) Attempt any Two questions. [12]

a.Describe water quality standards in detail. (6)

b. Explain Advanced Waste water treatments-Reverse Osmosis in detail. (6)

c.What is importance of the wastewater treatment plant? (6)

Q3) Attempt any Two questions. [12]

1.Define Neutralization process. (6)

2.Explain in detail flow diagram of Textile industry treatment plant. (6)

3.What is importance of Industrial waste water treatment plant? (6)

Q4) [12]

SECTION II

Attempt any Two questions.

a.Define Transportation methods of the Municipal Waste. Explain any one in detail (6)

b.Explain disposal methods of the Biomedical waste. Define any one in detail. (6)

c.Describe Reuse of C&D waste. (6)

Q5) Attempt all the questions. [11]

a.Define classification of the Hazardous waste. (5)

b.Explain rules &regulations of Hazardous waste. (6)

Q6) Attempt any two questions. [12]

a. Explain E-Waste management rules 2016 in detail. (6)

b. Describe reuse and recycle of E-Waste (6)

c.Define segregation of E-Waste. (6)

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Seat No. CE-3rd Sem-6th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Environmental Engineering-II

Sub. Code: 66877/81517/81794

Day and Date: MAY ,18-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever necessary
4. Figures to the right indicate full marks

Q1) Solve the following [11]

1. Explain types of sewers in detail. [5]

2. Following observations were made on 3 % dilution of wastewater. [6]
   DO of aerated water = 3 mg/l.
   DO of diluted water sample after 5 days of incubation = 0.8 mg/l.
   DO of wastewater sample = 0.6 mg/l.
   Calculate 5 days BOD & Ultimate BOD. Given KD = 0.10

Q2) Answer any two of the following. [12]

1. Explain trickling filter along with its biological process of attached growth. [6]

2. Explain the sewer appurtenances with respect to their function. [6]

3. Explain the activated sludge process with respect to its modifications. [6]

Q3) Answer any two of the following [12]

1. Enlist all Low cost treatment methods and Explain any one in detail. [6]

2. Give the types, advantages and limitations of waste stabilization pond. [6]

3. Give the design parameters for septic tank. [6]

Q4) Solve the following [11]

1. Explain the concept of self purification and DO sag curve. [5]

2. Give the effluent standards for stream and land disposal as per MPCB and CPCB standards. [6]

Q5) Answer any two of the following [12]

1. Explain types of solid waste in detail. [6]
2. Explain the concept of 'Hazardous Waste Management'. [6]
3. Write short note on Incineration with sketch. [6]

Q6) Answer any two of the following [12]

1. Discuss the issue of 'Global Warming' due to air pollution. [6]
2. What are various types of noises and their acceptable limits? [6]
3. What is the effect of air pollution on man, material and vegetation? [6]

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Seat No. CE. 3rd Sem- 6th

Total No. of Pages : 1

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Soil and Water Conservation Techniques

Sub. Code: 81519/81796

Day and Date: MAY ,22-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
2. Figures to the right indicate full marks

Q1) Attempt all questions. [11]

a) What are the causes of soil erosion? Explain briefly.

b) Explain concept of water conservation.

Q2) Attempt any two. [12]

a) Explain in detail – Terraces for soil erosion control.

b) Short note - Erosion due to water.

c) State principles of gully control.

Q3) Attempt any two. [12]

a) Explain impacts of stream bank erosion.

b) Enlist the methods of river training work and explain in details.

c) Write note on bank scour.

Q4) Attempt all questions. [11]

a) Enlist water harvesting techniques. Explain any one.

b) Short note - percolation tank.

Q5) Attempt any two. [12]

a) Explain case study on watershed modeling for soil.

b) Differentiate between physically based models and empirical models.

c) Classify watershed models based on nature of input and uncertainty.

Q6) Attempt any two. [12]

a) Enlist sources of ground water and explain any one in detail.

b) Explain ground water conservation techaiques.

c) Explain causes of ground water depletion.

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Seat No. CE-398- Sem-6th

Total No. of Pages : 3

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Theory of Structures

Sub. Code: 81515/81792

Day and Date: MAY ,10-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:

Special Inst.: 1) Q. No. 1 & Q. No. 5 are compulsory questions.

2) Solve any two questions from Q. No. 2 to Q. No. 4 and any two questions from Q. No. 6 to Q. No. 8.

3) Figures to the right indicate full marks.

4) Assume suitable data if necessary and state them clearly.

5) Use of non-programmable calculator is allowed.

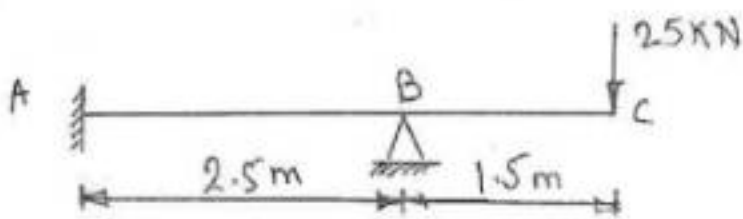
Q1) Write a short Note on following [7]

A) Explain in detail Degrees of freedom of the structure. [2]

B) Explain in detail Clapeyron's theorem of three moments. [3]

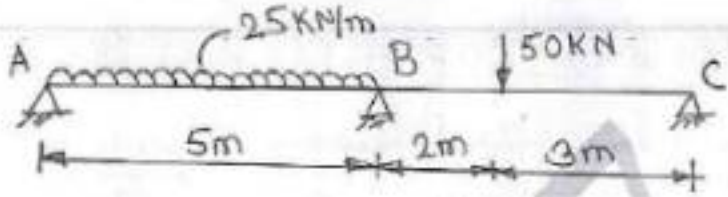
C) What is Unit load method explain in detail. [2]

Q2) Analyse the propped cantilever beam loaded as shown in the figure by using [14] Consistent deformation method. Also draw SFD and BMD.



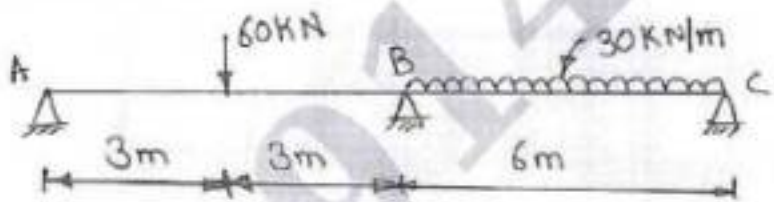
Figure

Q3) A continuous beam ABC is loaded as shown in the figure below. Find out supports moments and reactions by using Clapeyron's theorem of three moments. Also draw BMD. [14]



Figure

Q4) A continuous beam ABC is loaded as shown in the figure below. Find out supports moments and reactions by using Castigliono's theorem. Also draw BMD. [14]



Figure

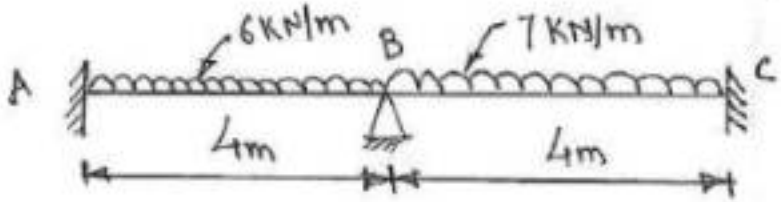
Q5) Write short note on following [7]

A) Explain Slope and deflection method in detail. [2]

B) Explain Stiffness factor used in Moment distribution method. [2]

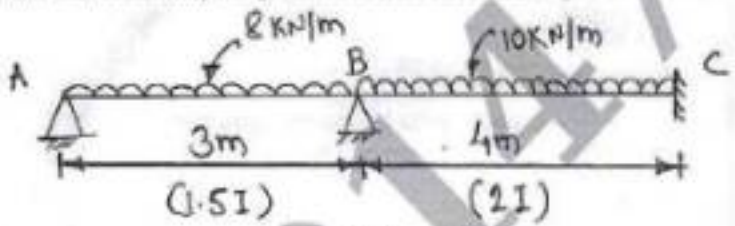
C) Write down properties of the stiffness matrix. [3]

Q6) A continuous beam is loaded as shown in the figure below. Find out supports moments and reactions by using slope and deflection equation. Also draw BMD. [14]



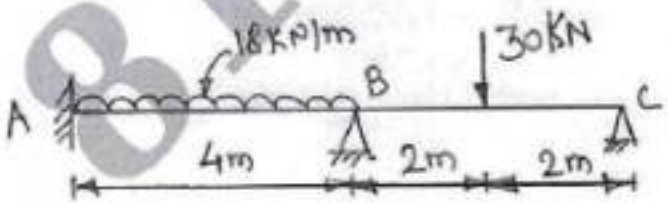
Figure

Q7) A continuous beam ABC is loaded as shown in the figure below. Find out supports moments and reactions by using moment distribution method. Also draw BMD. **[14]**



Figure

Q8) A continuous beam is loaded as shown in the figure below. Find out supports moments and reactions by using stiffness matrix method. Also draw BMD. **[14]**



Figure

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Seat No. CE-3rd Sem-6th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Geotechnical Engineering - II

Sub. Code: 66874/81518/81795

Day and Date: MAY ,14-05-2024 **Total Marks:** 70

Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Figures to the right indicate full marks

Special Inst.: Use of non-programmable calculator is allowed.

Q1) Answer the following questions [11]

a) Discuss in brief various types of soil samples. (05)

b) Describe the various modes of failure of rocks. (06)

Q2) Answer the following questions [12]

a) What are the Assumptions made in Terzaghi's Analysis? (05)

OR

b) Discuss the factors influencing bearing capacity of soil. (05)

c) A square footing of size 2.5 m × 2.5 m is built in a sandy soil of unit weight 17 kN/m3 and having angle of shearing resistance of 35°. The depth of base of footing is 1.2 m below the ground surface. Calculate the safe load that can be carried by a footing with a factor of safety of 3 against shear failure. Assume that the soil fails by general shear failure. Use Terzaghi's analysis. For $\varphi = 35°$, the values of bearing capacity factors are :-$Nc = 57.8$, $Nq = 41.4$, $N\gamma = 42.4$

Q3) Answer the following questions [12]

a) Under what circumstances a rectangular and trapezoidal combined footings are adopted ? (05)

OR

b) Explain the procedure for the Design of spread or Isolated footings. (05)

c) A saturated soil has a compression index of 0.25. Its void ratio at a stress of 10 kN/m2 is 2.02 and if the stress is increased to 19 kN/m2 , Compute the Settlement if the soil stratum is 5 m thick. (07)

Q4) Answer the following questions [12]

a) What is group efficiency of pile group? Explain feld's rule. (05)

OR

b) Explain with neat sketch under reamed pile and their uses. (05)

c) A group of 16 piles of 50 cm diameter is arranged with a centre to centre spacing of 1.0 m. The piles are 9 m long and are embedded in soft clay with

cohesion 30 kN/m2. Bearing resistance may be neglected for the piles—Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group. (07)

Q5) Answer the following questions [11]

a) Describe the methods of rectifying the tilt in the well during sinking operation. (05)

OR

b) Discuss the common types of coffer dam.(05)

c) Explain application of geosynthetic materials in Civil Engineering.(06)

Q6) Answer the following questions [12]

a) What are the cause slope instability? (05)

b) An embankment 10 m high is inclined at an angle of 36° to the horizontal. A stability analysis by the method of slices gives the following forces per running meter:

Σ Shearing forces = 550 kN,Σ Normal forces = 900 kN,Σ Neutral forces = 250 kN. The length of the failure arc is 27 m. Laboratory tests on the soil indicate the effective values c′ and φ′ as 20 kN/m2 and 18° respectively.Determine the factor of safety of the slope with respect to (a) shearing strength and (b) cohesion. (07)

* * *

Seat No. BE-3S-CM

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Geotechnical Engineering - II

Sub. Code: 66874/81518/81795

Day and Date: MAY ,14-05-2024 Total Marks: 70

Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Figures to the right indicate full marks

Special Inst.: Use of non-programmable calculator is allowed.

Q1) Answer the following questions [11]

a) Discuss in brief various types of soil samples. (05)

b) Describe the various modes of failure of rocks. (06)

Q2) Answer the following questions [12]

a) What are the Assumptions made in Terzaghi's Analysis? (05)

OR

b) Discuss the factors influencing bearing capacity of soil. (05)

c) A square footing of size 2.5 m × 2.5 m is built in a sandy soil of unit weight 17 kN/m3 and having angle of shearing resistance of 35°. The depth of base of footing is 1.2 m below the ground surface. Calculate the safe load that can be carried by a footing with a factor of safety of 3 against shear failure. Assume that the soil fails by general shear failure. Use Terzaghi's analysis. For $\varphi = 35°$, the values of bearing capacity factors are :-$Nc = 57.8$, $Nq = 41.4$, $N\gamma = 42.4$

Q3) Answer the following questions [12]

a) Under what circumstances a rectangular and trapezoidal combined footings are adopted ? (05)

OR

b) Explain the procedure for the Design of spread or Isolated footings. (05)

c) A saturated soil has a compression index of 0.25. Its void ratio at a stress of 10 kN/m2 is 2.02 and if the stress is increased to 19 kN/m2 , Compute the Settlement if the soil stratum is 5 m thick. (07)

Q4) Answer the following questions [12]

a) What is group efficiency of pile group? Explain feld's rule. (05)

OR

b) Explain with neat sketch under reamed pile and their uses. (05)

c) A group of 16 piles of 50 cm diameter is arranged with a centre to centre spacing of 1.0 m. The piles are 9 m long and are embedded in soft clay with

cohesion 30 kN/m2. Bearing resistance may be neglected for the piles—Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group. (07)

Q5) Answer the following questions [11]

a) Describe the methods of rectifying the tilt in the well during sinking operation. (05)

OR

b) Discuss the common types of coffer dam.(05)

c) Explain application of geosynthetic materials in Civil Engineering.(06)

Q6) Answer the following questions [12]

a) What are the cause slope instability? (05)

b) An embankment 10 m high is inclined at an angle of 36° to the horizontal. A stability analysis by the method of slices gives the following forces per running meter:

Σ Shearing forces = 550 kN,Σ Normal forces = 900 kN,Σ Neutral forces = 250 kN. The length of the failure arc is 27 m. Laboratory tests on the soil indicate the effective values c' and φ' as 20 kN/m2 and 18° respectively.Determine the factor of safety of the slope with respect to (a) shearing strength and (b) cohesion. (07)

* * *

Seat No. CE-3 Sem-6th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Engineering Management

Sub. Code: 81516/81793

Day and Date: MAY ,16-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever necessary
4. Figures to the right indicate full marks

Q1) solve the following questions **[11]**

A. Explain the principles of management by Henry Fayol. **[6]**

B. Describe in brief the process of decision making with diagram. **[5]**

Q2) Solve the followings. **[12]**

A. Draw the network, determine critical path, and find out project duration, total float and free float by using the data. **[7]**

Activity	1-2	2-3	2-4	3-4	3-5	4-6	5-6
Duration	10	15	16	8	12	17	16

B. What do you understand by network updating? Why is it necessary. **[5]**
OR
Explain in brief the procedure of network compression.

Q3) Solve the followings. **[12]**

A. Durations of activities of a project are given below. Draw PERT network, mark expected critical path and calculate expected project duration. Also calculate standard deviation (Variance) of the project. **[7]**

Activity	Duration (days)		
	To	Tm	Tp
1-2	5	7	9
2-3	11	14	17
2-4	13	15	1
2-5	4	6	8
3-7	9	10	11
4-5	0	0	0
5-6	3	3	3
6-8	5	12	17
7-8	2	4	8

B. Discuss regarding Microsoft project software and its applications. [5]

Q4) Solve the followings. [12]

A. Explain in detail HML Analysis. [6]

B. A construction company requires 1800 tons of steel every year. It costs Rs 35000 per ton. It requires Rs. 140 to place order once. If inventory carrying costs is 13 % of an average inventory investment. Determine EOQ. [6]

Q5) Solve the followings. [12]

A. Explain 'Benefit Cost Ratio 'and 'Payback period' methods. [6]

B. Suggest which equipment should be purchased? If rate of interest is 11 % per year. Use (EUAC) method. [6]

	Equipment 'A'	Equipment 'B'
Initial cost (Rs)	25000	35000
Annual O & M cost (Rs)	9000	7000
Salvage value (Rs)	2500	4000
Service life (Yrs)	5	5

Q6) Attempt any Two. [11]

a) Draw a typical layout for site of construction of multistoried building.
b) With a neat flow chart describe the procedure of work study.
c) Define ISO 9000. Write the benefits of ISO 9000.

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Seat No. CE-4th Sem-7th. Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Transportation Engineering - I

Sub. Code: 83735/84015

Day and Date: MAY ,11-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever accessary
4. Figures to the right indicate full marks
5. Use of Scientific calculator is allowed

Q1) All questions are *compulsory*. [12]

a. Explain the requirements of an ideal highway alignment. [6]

b. Explain in brief: (i) NHAI (ii) MSRDC (iii) PMGSY. [6]

Q2) Attempt any two questions from following. [11]

a. Calculate extra widening required for a pavement width 7 m on a horizontal Curve of radius 300 m, if the longest wheel base of vehicle expected is 7 m.Design speed is 60 kmph. [6]

b. Explain 'Camber' and state IRC recommendations for camber. [5]

c. Explain the necessity of widening of pavements on curve with sketch. [5]

Q3) Attempt any two questions from following. [12]

a. Enlist various tests on bitumen and explain one in detail. [6]

b. Explain rigid and flexible pavement failures in detail. [6]

c. Write a Note on Stresses in rigid pavement. [6]

Q4) All questions are compulsory. [12]

a. Explain the construction steps for BBM in detail. [6]

b. What do you mean of evaluation of pavements explain structural and functional evaluation of pavement. [6]

Q5) Attempt any two questions from following. [11]

a. Explain: (i) Traffic Volume Study (ii) O and D Study [6]

b. Explain 'Regulatory Signs' with neat sketches. [5]

c. Explain surface and subsurface drainage of road with neat sketches. [5]

Q6) Attempt any two questions from following. [12]

a. Explain: (i) Shafts (ii) Pilot tunnels [6]

b. Explain various shapes of tunnels. [6]

c. Explain the shield method of tunneling. [6]

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Seat No. CE-4M Sem.-8th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Solid Waste Management

Sub. Code: 67569/83739/84019

Day and Date: MAY ,13-05-2024 **Total Marks:** 70

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Figures to the right indicate full marks

Special Inst.: 1. Q. No. 4 and Q. No. 8 are compulsory
2. Attempt any two questions from Q. No. 1, 2, 3 and any two questions from Q. No.5,6,7

Q1) Answer the following questions (each 5 marks) [10]
a) Define Solid Waste . Write the objectives of Solid Waste Management. (05)
b) What are the different types and sources of Solid Waste? (05)

Q2) Answer the following questions (each 5 marks) [10]
a) Explain the factors affecting MSW generation rate?
b) List the different MSW collection methods? Explain any one.

Q3) Answer the following questions (each 5 marks) [10]
a) What is transfer stations? Why do we need transfer stations?
b) With help of the flow diagram, explain Material Recovery Facility (MRF).

Q4) Answer the following questions (each 5 marks) [15]
a) Write note on Hazardous Waste Management.
b) Write short notes on Stationary container systems.
c) Explain different factors considering while planning & designing of Transfer station

Q5) Answer the following questions (each 5 marks) [10]
a) List the methods of Landfilling. Explain any one.
b) Discuss the criteria for Site Selection for MSW Landfill.

Q6) Answer the following questions (each 5 marks) [10]
a) What is composting? What are the benefits of composting?
b) List & explain the different factors governing Composting process.

Q7) Answer the following questions (each 5 marks) [10]
a) Explain various elements of incineration system.
b) Write the air pollution problem associated with Incineration and its control techniques.

Q8) Answer the following questions (each 5 marks) [15]

a) List & explain maintenance and precautions required for sanitary landfill.

b) Explain Aerobic & Anaerobic Composting.

c) Write advantage and disadvantage of Incineration treatment used to SW.

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Seat No. CE-Adm-Sem-7th

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Design of Concrete Structures-I

Sub. Code: 67558/83732/84012

Day and Date: MAY ,03-05-2024 **Total Marks:** 70

Time: 10:30 AM To 01:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever necessary
4. Figures to the right indicate full marks

Special Inst.: Use of IS 456-2000 is allowed

Q1) a) Find Xmax, Pt,lim, and Mu,lim for Fe250 and M20 grade concrete. (6) **[12]**

b) Explain the following (6)

i) Characteristic Strength

ii) Partial Safety Factors.

Q2) Design a balanced reinforced concrete beam section for an applied moment of 48kN-m. **[12]**

The width of beam is limited to 150mm. Use M20 Concrete and Mild Steel Grade-I

OR

Find reinforcement required for a doubly reinforced beam section to the following data,

Width of beam -250mm

Depth of beam to the centre of compression steel -500mm

Effective cover to the centre of compression steel -50mm

Max BM under working load condition -120kN-m

Safety Factor-1.5

Use M15 concrete & Fe250 steel.

Q3) A RC beam 230mm wide 450mm deep is reinforced with 3-16mmΦ of grade Fe415 on tension side with an effective cover of 50mm. Design the vertical shear reinforcement when full tension steel is available for ultimate SF of 80kN. **[11]**

Q4) Design a simply supported slab over a class-room of size 5m × 10m. A finishing surface of cement concrete of 20mm shall be provided over the slab. The slab shall be used as a class-room floor. M15 grade of concrete and mild steel reinforcement shall be used. **[12]**

OR

The overall dimensions of dog-legged stair are 4750mm × 2400mm with landing of

1125mm . The landing slab spans in the same direction as the stair and are supported by the walls at the ends. Design the stair slab. Provide M20 grade of concrete and HYSD-Steel bars of grade Fe415. The stair is used inside a residential building.

Q5) A short RCC column 400mm x 400mm is provided with 8-16mmΦ. If the effective length of column is 2.25m. Find ultimate load for the column. Use M15 concrete Fe250 Steel. [12]

Q6) Design an isolated rectangular sloped footing for the column of size 230mm×650mm, reinforced with 6-20mmΦ and carrying an axial load of 1200kN. The bearing capacity of the soil is 300kN/m2. Use concrete grade M20 and steel grade Fe415. Effective cover for bottom steel is 60mm. take offset from the face of the column equal to 50mm. [11]

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Seat No. CE-4-S 7th

QP-297

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Quantity Survey and Valuation

Sub. Code: 67560/83734/84014

Day and Date: MAY ,09-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:30 PM

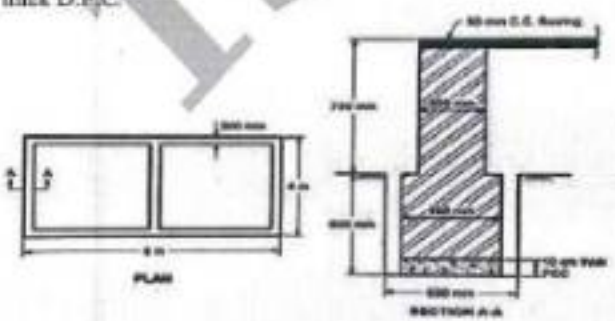
Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Figures to the right indicate full marks
3. Use of calculator and statistical table is allowed

Special Inst.: Questions No. 3 is compulsory. Attempt any 2 questions from remaining in Section I and any 3 questions from Section II.

Q1) a) Write down the Mode of measurement with reason in short as per the following: **[10]**
i) Partition Wall ii) 12 mm thick cement plastering iii) fencing iv) Stone masonry v) Door Frames
b) What is IS 1200? Write rules for deduction for plastering work as per code

Q2) a) What is meant by Task work? Explain its importance in rate analysis with suitable examples. **[10]**
b) Write detailed specification on UCRM (1:4)

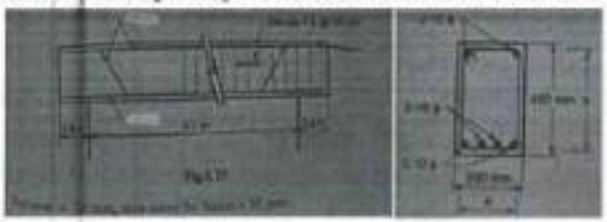
Q3) a) The plan and section of building is shown below prepare quantity estimate for the following items of work. **[12]**
1. Earth work in Excavation. 2. Earth work in plinth filling .
3. First class Brick work in cement mortar (1:6) for foundation and plinth, 4. 2.5 cm thick D.P.C.



Q4) Write Short Note on (Any TWO) **[10]**
a) Provisional sum and Provisional quantities.
b) Measurement sheet and abstract sheet.
c) Standard schedule of rate.

Q5) SECTION II [11]

Work out the quantity of steel for the beam as shown below:



Q6) a) Explain Price, cost and value with examples [6] [11]

b) What is mean by valuation? What are factors affecting valuation of Property. [5]

Q7) a) A Building Stands on a freehold plot of land measures 600 sqm yields a gross rent of Rs. 1000 per month. The price of land is Rs. 75/m2. The estimated future life of the building is 12 years, but is expected to extend by another 16 years. If structural and other repairs costing Rs. 16,000/- are immediately carried out. The total amount of outgoings is 25 % of the gross rent. The owner requires 7% return on land and 11% return on building with 6 % for redumption of capital. Find out whether it will be advisable to spend the above cost and 26 years of capital. Find out whether it will be advisable to spend the above cost of repairs from investment point of view. [9] [12]

b) Different types of values [3]

Q8) Write Short Note on (Any Two) [12]

a) Building lease and Occupation lease.

b) Capitalized value and year purchase.

c) Explain a note on bar bending schedule.

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QP-292

Seat No. CE-4th Sem-7th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Earthquake Engineering

Sub. Code: 67559/83733/84013

Day and Date: MAY ,04-05-2024 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbeled diagrams wherever necessary
4. Figures to the right indicate full marks
5. Use of Scientific calculator is allowed

Special Inst.: Use of IS 1893_2016 (part-I) is permitted.

Q1) Attempt any one **[7]**

a. Explain plate tectonic theory with neat sketch [7]

b. Explain seismic waves with schematic diagrams [7]

Q2) Attempt any two questions **[14]**

a. Derive the equation for logarithmic decrement [7]

b. Explain the phenomenon of resonance [7]

c. A spring mass (k1, m1) system has a natural frequency f1. Calculate the Value of stiffness of other spring which when connected to k1 in series decreases the frequency by 50% [7]

Q3) A four storied square RC framed residential building as shown in Fig.1 with live load 4kN/m^2 is to be constructed on hard soil strata in zone V. Determine the seismic forces on the structure by seismic coefficient method using IS 1893 part (I). All beams and columns size 300mmx 450 mm. Thickness of roof and floor slab 120 mm . Wall is of 230 mm thick all around. Height of each floor is 3m. Density of concrete 25kN/m^3 and masonry 20kN/m^3. Assume 5% damping **[14]**

P.T.O.

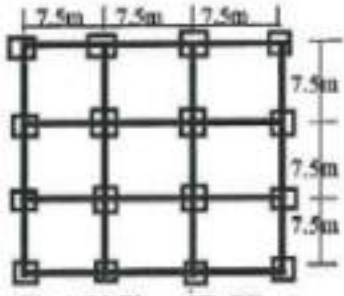

Fig.1 Q3-Plan of Building

Q4) Attempt any two question [12]

a. Explain soft storey& discuss its performance of soft storey building in past earthquakes. How will you avoid soft storey? [6]

b. How dose ductility affect overall behavior of the building? [6]

c. Explain the concept of strong column and weak beam? [6]

Q5) Attempt all questions [12]

a. What is jacketing? Explain the jacketing of beams with illustrative sketches [6]

b. Define RC band? At what level in a masonry building would you provide them? Why? [6]

Q6) Attempt all questions [11]

1. Explain active control system and passive control system [6]

2. Explain with sketch Viscous fluid dampers. [5]

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Seat No. CE- 4th-8th.

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Advanced Design of Concrete Structures

Sub. Code: 67751/84753/84938

Day and Date: MAY ,13-05-2024 **Total Marks:** 70

Time: 02:30 PM To 05:00 PM

Instructions:
1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labbelet diagrams wherever necessary
4. Figures to the right indicate full marks
5. Use of Scientific calculator is allowed

Special Inst.: Use of IS 456:2000, IS 3370 is allowed

Q1) Design an interior panel of a flat slab with panel size 6m x 6m supported by columns of size 500mm x 500mm. Provide suitable drop. Take live load as 4kN/m2, Use M20 concrete and Fe415 steel. Show reinforcement details. **[12]**

Q2) A 250mm thick reinforced concrete vertical wall of height 3.6m is supported over 500mm wide piers having clear spacing of 5.1m. The wall carries service superimposed load 190kN/m. Design the panel as a deep beam considering it to be simply supported. The materials of constructions are M20 concrete and HYSD steel of grade Fe415. **[12]**

OR

Design a simply supported 300mm thick RCC vertical deep beam of height 4m, which is supported over 500mm wide piers having a clear spacing 5m. The beam carries a service superimposed load 200kN/m. Assume M20 grade & Fe415 grade steel.

Q3) Design a chimney of height 70m, Given **[11]**

External Diameter –(i) at top -4m

(ii) at base – 4.8m

Shell thickness –(i) at top -200mm

(ii) at base – 400mm

Wind intensity 1.8kN/m2, throught.

Thickness of fire brick lining 100mm.

Air gap -100mm

Temperature difference -700C.

Coefficient of thermal expansion -11×10-6/C0

Es - 210×103 N/mm2

Unit weight of brick lined -20kN/m3

Use M25 concrete and Fe 415 grade steel.

Note-No Check for stresses is required

Q4) Design a flat bottom circular elevated water tank of diameter 12m and total height 3.2m which is to be supported by ring beam of 9m diameter. The ring beam is to be supported by eight columns equally placed. Use M25 concrete and Fe415 steel. Design the following components, [12]

a) Top dome

b) Top ring beam

Q5) Design only Stem of cantilever retaining wall to retain an earth embankment with horizontal top 3.5m above ground level. Density of earth=18kN/m3. Angle of internal friction Φ=300 SBC of soil is 200kN/m2.Take coefficient of friction between soil and concrete =0.5. Adopt M20 grade concrete and Fe-415 steel. Show reinforcement details. [12]

OR

Design the stem of counterfort retaining wall if the height of wall above ground level =5m. SBC of soil=180kN/m2. Angle of friction Φ=300. Density of soil = 18kN/3. Spacing of counterforts =3mc/c. Adopt M20 concrete and Fe-415 steel

Q6) A simply supported circular slab of radius 2.8m is reinforced with 10mm bars at 180mm centre to centre in two mutually perpendicular directions. Average effective depth is 100mm and overall depth is 125mm. If concrete of grade M20 and steel of grade Fe-415 are used, determine how much service load it can carry. Take finishing load as 1kNm2. [11]

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Seat No. CE-4th Sem: 8th. Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Transportation Engineering-II

Sub. Code: 67750/84747/84932

Day and Date: MAY ,11-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. Draw neat labbelet diagrams wherever necessary
2. Figures to the right indicate full marks

Special Inst.: Q. No.4 and Q. No. 8 are compulsory and attempt any two questions from Q. No. 1,2,3 and any two questions from Q. No. 5,6,7.

Q1) Attempt all questions. **[10]**

a. Explain with a neat sketch Minimum Turning Radius and Minimum Circling Radius of an aircraft. [5]

b. Draw a neat sketch and describe component parts of an aircraft. [5]

Q2) Attempt all questions. **[10]**

a. Describe the various systems of the aircraft parking. [5]

b. What are the requirements of airport drainage? [5]

Q3) Attempt all questions. **[10]**

a. Explain the concept of 'Littoral Drift'. [5]

b. What are breakwaters? Explain the types of breakwaters with sketches. [5]

Q4) Write a short note on the following. **[15]**

a. Fuselage [5]

b. Zoning Laws [5]

c. Transit Shade [5]

Q5) Attempt all questions. **[10]**

a. State merits and demerits of railways. [5]

b. Define points and crossing and draw sketch of right hand turnout. [5]

Q6) Attempt all questions. [10]

a. State objects of signaling and enlist advantages of automatic signaling. [5]

b. Enlist the elements and necessity of geometric design of track. [5]

Q7) Attempt all questions. [10]

a. What are the factors considered for selecting a site of a bridge? [5]

b. Enlist the different type of loadings used for designing of bridge. [5]

Q8) Write a short note on the following. [15]

a. Loads acting on a bridge. [5]

b. Permanent way and its component parts. [5]

c. Modern trends in Railways. [5]

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QP-294

Seat No. CE-4th Sem - 6th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Water Resources Engineering - II

Sub. Code: 67749/84746/84931

Day and Date: MAY ,09-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labbelet diagrams wherever necessary
3. Figures to the right indicate full marks
4. Use of Scientific calculator is allowed

Special Inst.: Question number 4 and 8 is compulsory. Solve any two questions from question 1,2 and 3 and solve any two questions from question 5,6 and 7.

Q1) a) Explain the types of Reservoirs ? (5) **[10]**
b) Give Classification of earthen dams ? (5)

Q2) a) Which are the forces acting on gravity dams? (5) **[10]**
b) What is Theoretical and Practical Profile of gravity dam ? (5)

Q3) a) Give Classification of spillways? (5) **[10]**
b) What are different types of spillway gates? Explain in detail (5)

Q4) Write short notes (Solve any three) **[15]**
a) Ogee Spillway (5)
b) Galleries in Gravity dam (5)
c) Reservoir Sedimentation (5)
d) Swedish slip circle method (5)

Q5) a) Draw a layout of Diversion head work and explain functions and constructional features of the same ? (5) **[10]**
b) Define weir and barrage ? Explain various types of weir ? (5)

Q6) a) Classify different types of canals? (5) **[10]**
b) Describe different types of canal lining ? (5)

Q7) a) Draw a layout of high head scheme and explain functions of each component ? (5) **[10]**
b) What are the objectives of river training works? Explain any one river training work in detail ? (5)

Q8) Write Short Notes on(Solve any four) **[15]**
a) Divide Wall and Fish ladder (5)
b) Exit gradient

P.T.O.

c) Inlet and outlet (5)

d) Daft Tube and Scroll casing (5)

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CE-4th Sem-8th

QP-444

Seat No. CE-4th Sem-8th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Advanced Construction Techniques

Sub. Code: 67764/84759/84944

Day and Date: MAY ,15-05-2024

Total Marks: 70

Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Figures to the right indicate full marks

Special Inst.: 4) Answer shall be supported by adequate sketches.

Q1) Q.no.1 Attempt all questions. [12]

a) What are the requirements of Good formwork?

b) Explain the different factors influence the cost of formwork.

Q2) Q.no.2) Attempt any Two [11]

a) Write a note on thermosetting Adhesive.

b) What is Adhesive? Write their Uses.

c) Define Geosynthetics. State Benefits& Barriers.

Q3) Q.no.3) Attempt any Two. [12]

a) What are the adventages & disadvantages of Vaccum Consolidation?

b) Explain Soil nailing in detail with sketch.

c) What is Soilcrete? Explain in detail.

Q4) Q.no.4) Attempt all questions. [12]

a) What is Cofferdam? Write the necessity of cofferdam.

b) Explain different types of Caissons with neat sketch.

Q5) Q.no.5) Attempt any Two. [11]

a) Explain the necessity of Bridge Rehabilitation.

b) Write a note on Diaphragm walls.

c) Explain Methods of Bridge rehabilitation with sketch.

Q6) Q.no.6) Attempt any Two. [12]

a) Explain with neat Sketch the Vacuum Dewatering Process.

b) State the Mechanism of Revibration of concrete.

c) Explain the Importance of Strengthening of Foundations.

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QP-269

Seat No. CE-4-S-8th

Total No. of Pages : 2

MAR-APR-2024 SUMMER EXAMINATION

B.Tech. CBCS

Sub. Name: Design of Concrete Structures-II

Sub. Code: 67748/84745/84930

Day and Date: MAY ,03-05-2024 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Use of Scientific calculator is allowed

Special Inst.: Use of I.S.: - 456 Code is allowed.

Q1) A rectangular beam 300mm wide X 400mm overall is reinforced with 2 no. of 12mm dia. bars at top and 2 no. of 16 mm dia. bars at bottom each provided with an effective cover of 40mm. Determine the resistance of beam in pure torsion. Use M20 grade of concrete and Fe415 grade of steel. **[12]**

OR

Design the reinforcement required for a rectangular beam section having width 350mm and over all depth 700mm, with effective cover of 50mm. Beam is subjected to Ultimate Bending Moment – 200KNm, Ultimate Torsional Moment – 75KNm and Ultimate Shear Force – 120KN. Use M20 grade of concrete and Fe415 grade of steel.

Q2) A continuous beam ABCD is simply supported at A and B and is continuous over supports B and C. The spans of the beam are L(AB) = L(CD) = 4.0m and L(BC) = 4.5m. The beam carries a live load of 15KN/m and a dead load of 20KN/m. By using IS code provisions design the beam for flexure **[12]**

Q3) Design a suitable circular water tank resting on ground with flexible base for a capacity of 4 lakes liter. Use M20 grade of concrete and Fe415 grade of steel. **[11]**

Q4) A simply supported prestressed concrete beam of cross section 200mm wide X 300mm deep is loaded with live load of 6KN/m over a span of 6m in addition to self weight. The beam is prestressed by prestressing force of 280KN, at an eccentricity of 50mm below the centriodial axis. Take unit weight of concrete as 25KN/m3. Find the stresses at extreme fibers at mid span section When - **[12]**

i)The beam is subjected to self weight only. And

ii) The beam is subjected to self weight and live load

Q5) A post tensioned beam 150mm X 300mm is having parabolic cable consisting of 12 wires of 5mm dia. The cable having eccentricity of 50mm at mid span and zero at ends. The initial stress in steel is 1000N/mm2. Find the total % loss of prestress. **[11]**

Take – i) The span -10m, ii) μ - 0.35/rad. iii) k – 0.0015/m,
iv) Relaxation of steel – 3%, v) Ec – 35000 N/mm2, vi)Es – 210000 N/mm2,
vii) Creep coefficient – 2.5, viii) Shrinkage strain – 0.0002

Q6) Design a prestressed concrete beam to the following data – **[12]**
i) Span – 9m, ii) Live Load – 25 KN/m,
iii) Allowable initial compressive stress in concrete – 17.5N/mm2,
iv) Allowable final compressive stress in concrete – 14N/mm2.
v) Allowable initial and final tensile stress in concrete – 1N/mm2.
vi) Assume loss of prestress – 20 %,
vii) Safe stress in steel - 1000 N/mm2

OR

Solve any Two of the following –
i) Why high strength steel and high strength concrete is required for prestressing.
ii) Explain in detail all the three concepts used for the analysis of prestressed concrete section.
iii) Explain Merits and Demerits of prestressed concrete

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