Bachelor of Engineering
Sixth Semester Examination, June-2021
Water Supply & Waste Water Engineering-II [CE-601]
Branch-Civil

Time: 3:00 Hrs   **Max Marks 70**

Note: (i) Attempt any five questions. All question carry equal marks.
(ii) Assume suitable data necessary and state them clearly.

Q.1 (a) Discuss the comparative merits and demerits of the separate system and combined system of sewerage
(b) What are the various methods of cleaning of sewer? Describe in brief?

Q.2 (a) Explain any two rural water supply schemes?

(b) What do you understand by the term "Self cleansing velocity in sewers"?

Q.3 (a) Define a) Filtration b) Disinfection c) Aeration d) Water softening

(b) If 5 day 20° Celsius is 225mg/litre, what would be its 8 day BOD at 15° Celsius temperature? Assume de-oxygenation coefficient, K_d= 0.15 at 20° Celsius?

Q.4 (a) What is land treatment? Discuss the conditions under which it is suitable?
(b) Describe the Aerobic and Anaerobic cycles taking parts in stabilisation of organic matter in nature

Q.5 (a)What do you understand by Grit chambers? Write the various design parameters with its neat sketch?
(b) What do you understand by Type I, Type II, Type III, Type IV sedimentation? Explain clearly?

Q.6 Design the parabolic section of a Grit chamber for the following data :
Maximum flow; 50000m^3/day
Minimum flow; 12000m^3/day
Average flow; 30000m^3/day

Horizontal Velocity; 0.25m/sec

Q.7   (a) What do you understand by the efficiency of Trickling filter?
       (b) Discuss in brief various design parameters used for settling tank

Q.8   (a) Explain in brief various methods used for Aeration in the activated
       sludge process?
       (b) Design the dimensions of a septic tank for a small colony of 200
       persons provided with an assured water supply from water works at a
       rate of 135 litre/capita/day
       Assume: i) 85% water converted into sewage
                   ii) Rate of sludge deposition – 30litres/capita/year
                   iii) The period of cleaning – 2 years

Bachelor of Engineering
Sixth Semester Examination, June-2021
Geotechnical Engineering-I [CE-602]
Branch-Civil

Time: 3:00 Hrs   **Max Marks 70**

Note: **(i) Attempt any five questions. All question carry equal marks.**
(ii) Assume suitable data necessary and state them clearly.

Q.1   (a) Explain the classification system based on particle size and consistency limits of soils.
(b) Explain "Sand replacement method" of field density determination.

Q.2   (a) Derive the relation between degree of saturation, void ratio, water content and specific gravity of soil particles

(b) Derive relation between void Ratio and porosity

Q.3   (a) A soil has liquid limit and plastic limit of 47% and 33% respectively. If the volumetric shrinkage at the liquid limit and plastic limit are 44% and 29%. Determine the shrinkage limits

(b) Classify coarse and fine grained soil as per Indian standard

Q.4   (a) Define flow index and toughness index

(b) A partially saturated sample from a borrow pit as a natural moisture content of 15% and bulk unit weight of 1.9 gram/cc. The specific gravity of solids is 2.70. Determine the degree of saturation and void ratio. What will be the unit weight of sample of saturation?

Q.5   (a) Explain the underline theory shrinkage limit of determination and explain methods to perform grain size analysis

(b) Define consistency, sensitivity of clay, stokes law and hydrometer analysis

Q.6   (a) A Sand specimen 40 square centimetre in area and 15 centimetres long is tested in a constant head permeameter under a head of 40centimtre. Discharge collected in 10 minutes was 200cc. porosity of the sand specimen was 35%. Compute permeability. Discharge velocity and seepage velocity.

(b) What is Darcy's law?/ What are its limitations and also define its validity

Q.7   (a) What is quick sand condition and define seepage pressure and critical hydraulic gradient
(b) How to determine 'Coefficient of consolidation' by logarithm of time fitting method
(c) Draw failure Mohr's envelope for specimens total stress tested under consolidated drained condition

Q.8   Write short on
        (a) Tri-axial compression test
        (b) Effective stresses
        (c) Reinforced earth retaining wall
        (d) Flow net

Bachelor of Engineering
Sixth Semester Examination, June-2021
Transportation Engineering-I [CE-603]
Branch-CIVIL

Time: 3:00 Hrs   **Max Marks 70**

Note: **(i) Attempt any five questions. All question carry equal marks.**
(ii) Assume suitable data necessary and state them clearly.

Q.1   (a) Briefly classify various road patterns.
(b) Describe various road development plans in India.

Q.2   (a) Explain remote sensing and its applications.
(b) Explain aerial photography and its applications.

Q.3   (a) Elaborate various cross section elements of road.
(b) Calculate the extra widening required for a pavement of width 7.0 m on a horizontal curve of radius 200m if the longest wheel base of vehicle expected on the road is 6.5 m. Design speed is 65kmph?

Q.4   (a) A national highway passing through a rolling terrain has two horizontal curves of radius 450m and 150 m. Design the required super-elevation for the curves as per IRC guidelines.
(b) Calculate the extra widening required for a pavement of width 7.0m on a horizontal curve of radius 200m if the longest wheel base of vehicle expected on the road is 6.5 m design speed is 65kmph.

Q.5   (a) List out all methods of conducting origin and destination studies and explain any two methods in detail.
(b) Describe how traffic can be controlled.

Q.6   (a) Explain different types of signs used in traffic with examples.
(b) What are the advantages and disadvantages of rotary. Road Pattern?

Q.7   (a) Explain intelligent transportation system.
(b) Explain Mass rapid transit system and light rail transit.

Q.8   (A) Explain the following terms with reference to airport lighting
(a) Threshold light   (b) Approach light   (c) Runway boundary light
(B) Define the following:
(a) Landing strip   (b) Runway
(c) Taxiway   (d) Appron

Bachelor of Engineering
Sixth Semester Examination, June-2021
Structural Design-I (RCC) [CE-604]
Branch-CE

Time: 3:00 Hrs   **Max Marks 70**

Note: **(i) Attempt any five questions out of eight.**
            (ii) All questions carry equal marks.
            (iii) Assume suitable data if necessary & state them clearly.

Q.1   (a) Differentiate between Working stress method of design and Limit state method of design?
       (b) Define Neutral axis, Lever arm, and Effective depth and Section modulus?

Q.2   (a) What do you understand by Strength criterion and Serviceability criterion clearly explain?
       (b) Find the moment of resistance of a R.C. Beam 180×400mm. The beam is reinforced with 4 to 12 mm diameter bars in tension zone. The effective cover to the reinforcement is 30mm. Use M20 grade of concrete and Fe415 for steel. Also state type of beam?

Q.3   (a) Elaborate various properties of concrete and reinforcing steel?
       (b)For a Rectangular beam of size 250mm wide and 520mm effective depth find out the depth of neutral axis, Balanced lever arm, Balanced moment of resistance and balanced steel area. Also apply shear and development length checks. The materials are M20 grade and HYSD steel of Fe-415.

Q.4   (a) Design a singly reinforced rectangular beam carry a live load of 55Kn/m. Beam has a span of 5m. Use M20 grade of concrete and Fe415 steel HYSD. Apply all strength and Serviceability checks.
       (b) In case of singly reinforced beam at which position reinforcement will provide and why it is provided?

Q.5   (a) A singly reinforced RC beam has an Effective depth of 400mm and a breadth of 250mm. It contains 4-16mm bars. For M20 grade concrete and Fe415 grade steel. Calculate the shear reinforcement needed for a factored shear force of 250KN.

(b) Design a Simply supported roof slab for a room 8.0×3.5 meter clear in size if the live load 4 KN/m^2 . The slab is simply supported on all the four edges. Exposure condition is moderate. Check for deflection also

Q.6   Design a Two way slab for a room size of 4.5×3.5m with end conditions are simply supported and corners held down (Not free to lift up). Live load may be assumed 6 KN/m2 and Floor finishing load 1.1Kn/m^2. Use M20 Grade concrete and Fe415 steel. Also apply necessary checks
       (b) Define under reinforced section and over reinforced section?

Q.7   (a) What are basic difference s between one way slab and two way slab?
       (b) Why Torsional steel is provided in case of two way slab?

Q.8   (a) Design a simply supported circular slab of diameter 5m. The slab is subjected to uniformly distributed load of 4 KN/m^2
       (b) Design a short column subjected to carry an axial load of 1400KN. Factored moment of resistance in one direction as 65KN-M and moment in other direction as 45 KN-M

Bachelor of Engineering
Sixth Semester Examination, June-2021
Construction Planning & Management [CE-605]
Branch-Civil

Time: 3:00 Hrs   **Max Marks 70**

Note: (i) Attempt any five questions. All question carry equal marks.
(ii) Assume suitable data necessary and state them clearly.

Q.1   (a) What are the optimistic, pessimistic and most likely time used in PERT?
        (b) Compare programme evaluation and the review technique with critical path method.

Q.2   (a) Describe the difference between CPM and PERT network.
        (b) Describe meaning and significance of the following terms used in network analysis.
        (i) Cost slope   (ii) Dummy activity   (iii) Expected time

Q.3   (a) What type of personal management problems are likely in construction Projects? How effectively these can be solved with available management tools?
        (b) Draw a neat sketch of job layout for the construction of multi-storeyed building. Explain the different parts

Q.4   Explain in detail the following construction equipment's
        (a) Pile driving
        (b) Hoisting
        (c) Compaction

Q.5   Discuss the following types of contract with their relative merits and demerits
        (a) Labour contract   (b) Lump sum contract   (c) Item rate contract

Q.6   Write detailed specification for the following
        (a) First class brick masonry
        (b) Plain concrete of M-20

Q.7   (a) What is the measurement book? How are the measurement recorded in it?
        (b) What is meant by organisation chart? Explain with examples?

Q.8   (a) Draw the organisation chart of a small construction company?

(b) Write short notes on the following
    (i)   Safety engineering
    (ii) Changes in contract