

320611(20)

B. E. (Sixth Semester) Examination, 2020

(Old Scheme)

(Civil Engg. Branch)

STRUCTURAL ENGINEERING-DESIGN-II

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) is compulsory and attempt any one from rest parts (b) and (c). Use of IS 800 is permitted.

Unit-I

1. (a) What is shape factor? 2

(b) Draw stress-strain curve for mild steel and explain its salient features. 14

- (c) A simply supported beam of rectangular section and span 'L' carries a concentrated load at the centre. Find at the stage of collapse and what part of the beam is fully elastic. 14

Unit-II

2. (a) Define pitch and gauge. 2
- (b) (i) Write advantages and disadvantages of a welded connection. 14
- (ii) Write various failures modes of a riveted joint. 14
- (c) Design a tension member of a single T-section 2.75 m long to carry an axial load of 275 kN. Design also the connection of the member of 10 mm thick gusset plate with 18 mm dia. rivets. 14

Unit-III

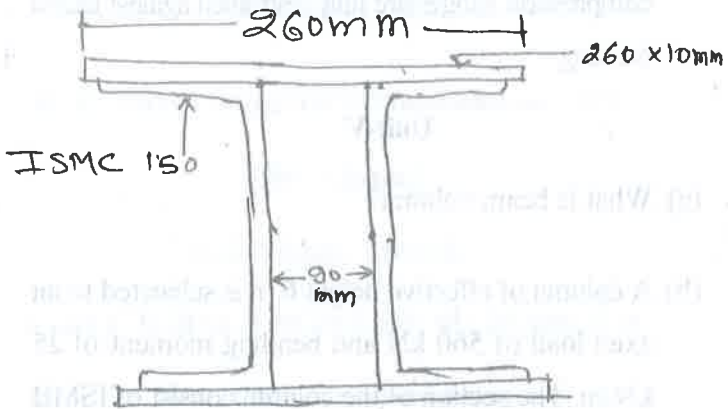
3. (a) Define column bases. 2
- (b) A column of 2.75 m effective length consists of two

[3]

channels with cover plates as shown in fig. calculate two safe axial compressive load on the column.

Take $f_y = 250 \text{ N/mm}^2$.

14



- (c) Design a slab base plate for a steel column ISHB 350 @ 67.4 kg/m, carrying a total load of 900 kN. Bearing strength of concrete may be taken as 4 N/mm².

14

Unit-IV

4. (a) Define Laterally Supported beams. 2
- (b) A simply supported beam has an effective span of 7 m carries a Udl of 50 kN/m. Taking $f_y = 250 \text{ N/mm}^2$ and $E = 2 \times 10^5 \text{ N/mm}^2$. Design the beam if it is laterally supported. 14

[4]

- (c) Redesign the beam of above example (Q. 4 b) if it is laterally unsupported. Each end the beam is restrained against torsion and ends of the compression flanges are fully restrained against lateral bending. 14

Unit-V

5. (a) What is beam column? 2
- (b) A column of effective height 6 m is subjected to an axial load of 560 kN and bending moment of 25 kN-m. The section of the column consist of ISMB 600 @ 122.6 kg/m. Check the adequacy of the section. Take $C_m = 0.85$. 14
- (c) A beam-column of effective length of 6 m carries an axial load of 450 kN and equal and moments of 50 kN-m each about the major axis. Design the H-section of the column. Assume that the frame falls under case (b) and the column bends either in single or double curvature. 14

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B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engg. Branch)

ENVIRONMENTAL ENGINEERING-I

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions Part (a) of all question is compulsory and carries 2 marks. Attempt any two parts from rest. Each part carries 7 marks. Draw neat sketches wherever required.

1. (a) What is LPCD?
- (b) Explain with neat sketch logistic curve method!

- (c) Following data have been noted from census department.

Year	Population
1940	8000
1950	12000
1960	17000
1970	22500

Calculate the probable population in the year 1980, 1990.

- (d) Explain with neat sketch river intake well.
2. (a) What is blue baby disease?
- (b) What is turbidity? Explain any two methods of turbidity.
- (c) Waterworks of a town treat 35×10^6 liters/day. The water is treated by coagulation-sedimentation tanks. The quantity of filter alum is consumed at 20 mg/l of water. If the alkalinity of the raw water is equivalent to 4.5 mg/l of CaCO_3 , determine the quantity of filter alum and the quick lime (containing 80% of

CaO) required per month by the water works. Molecular weights are given as (Ca = 40, C = 12, S = 32, O = 16, Al = 27 and H = 1).

- (d) Describe the Jar test with neat sketch for determining coagulant dosage.
3. (a) What is break point chlorination?
- (b) Explain operational troubles in rapid sand filter.
- (c) Design five slow sand filter beds from following data for the water works of town of population 75,000 per capita demand = 135 LPCD. Rate of filtration = 210 liters/hr/m². Assume data if required. Average demand out of five units, one is to be kept as stand by and used while repairing other units.
- (d) Explain chlorine chemistry with neat sketch of break point chlorination.
4. (a) Which one of the following tests of water employs Erichrome Black T as an indicator :
- (i) Hardness
- (ii) Residual chlorine

- (iii) COD
 - (iv) Total solids
 - (b) Enlist requirements of Good Distribution System.
 - (c) Compare merits and demerits of Ion exchange with zeolite process.
 - (d) Explain with neat sketch zeolite process of water softening.
5. (a) Which of these are secondary pollutants?
- (i) CO_2
 - (ii) NO_2
 - (iii) Hydrocarbons
 - (iv) O_3
- (b) Describe the electronic precipitator and bag filter for particulate matter control with neat sketch.
- (c) Describe the effects of air pollution on human.
- (d) Classify different type of air pollution.

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B. E. (Sixth Semester) Examination 2020

(Old Scheme)

(Civil Engg. Branch)

TRANSPORTATION ENGINEERING-II

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory and carries 2 marks. Attempt any two parts from (b), (c) and (d) which carry 7 marks each.

Unit-I

1. (a) What are the merits of rail transportation compared to road transportation?

2

[2]

- (b) What do you mean by gauge of a railway track? Describe the different gauges used in India. What are the problems due to use of different gauges? 7
- (c) Explain the following terms : 7
- (i) Coning of wheel
 - (ii) Length of rail
 - (iii) Rail joints
- (d) Explain the creep of rail giving different theories. What are the effects of creep on railway track? 7

Unit-II

2. (a) What are requirements of good sleepers? 2
- (b) From a main line curve of 5° on a BG track, a branch line of 8° diverges in opposite direction. If the maximum speed permitted on main line is 90 kmph, calculate the super elevation and maximum speed on branch line. 7
- (c) Explain the following terms : 7
- (i) Cant deficiency

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- (ii) Transition Curve
 - (iii) Bearing Plates
- (d) What are the requirements of good ballast? Using a sleeper density of $(n + 6)$, determine the number of sleepers required for constructing a B G track 2210 m long. 7

Unit-III

3. (a) What is Gathering Lines? 2
- (b) Explain the following with neat sketches : 7
- (i) Diamond crossing
 - (ii) Crossover
 - (iii) Turn triangle
- (c) Draw a neat cross-section of switch showing all component parts. Design a turnout with 1 in 12 crossing from the following data : 7
- (i) Gauge = 1.676 m
 - (ii) Heel divergence = 13.3 cm
 - (iii) Straight arm between TNC and TP of crossing curve = 1.346 m

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[4]

(iv) Angle of crossing $34^{\circ} 45' 49''$

(v) Angle of switch = $1^{\circ} 8' 0''$

(d) Describe different methods of interlocking giving neat sketches. 7

Unit-IV

4. (a) Explain drainage of tunnels. 2

(b) Describe the "Using Needle Becam" method of tunneling giving neat sketch. 7

(c) Write notes on the following : 7

(i) Lining of tunnels

(ii) Ventilation of tunnels

(iii) Shapes of tunnels

(d) Explain any one method of tunneling in rocks, in details giving neat sketches. 7

Unit-V

5. (a) What do you mean by Artificial Harbor? 2

(b) What do you mean Breakwaters? Describe any two types of breakwaters in details. 7

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[5]

(c) Write notes on : 7

(i) Dry dock

(ii) Fishing Harbour

(iii) Harbour of refuge

(d) Explain the following : 7

(i) Jetties

(ii) Wharves

(iii) Navigational aids

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B. E. (Sixth Semester) Examination, April-May 2020

(Old Scheme)

(Civil Engg. Branch)

CONSTRUCTION PLANNING & MANAGEMENT

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

***Note : Part (a) of each question is compulsory.
Attempt any two parts from (b), (c) and (d)
question in each unit.***

Unit-I

1. (a) What are the objectives of cost control? 2
- (b) What are the different stages and types of planning in construction management? 7

[2]

- (c) Explain the cost control system. 7
- (d) What are the advantages and disadvantages of project planning? 7

Unit-II

- 2. (a) Define PERT. 2
- (b) Write about the characteristics of CPM/PERT projects. 7
- (c) What are the short comings of bar chart? How are these removed? 7
- (d) Find the floats of all activities and the critical path of the network given in figure-1. 7

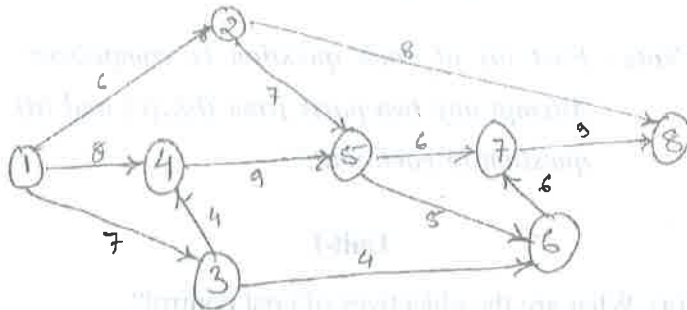


Fig. (1)

Unit-III

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- 3. (a) What do you understand by arbitration? 2
- (b) Discuss the different factors leading to accidents in construction projects. 7
- (c) Explain the basic elements of quality with a flow diagram. 7
- (d) What are the difference between traditional management and TQM? 7

Unit-IV

- 4. (a) What is MIS? 2
- (b) Write notes on : 14
 - (i) Economic Analysis
 - (ii) Technical Analysis
- (c) Explain the schematic diagram for feasibility study. 14

Unit-V

- 5. (a) What do you mean by Hauling? 2
- (b) What are the factors affecting the selection of construction equipments? 7

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- (c) Write a brief note on : 7
- (i) Scrapers
 - (ii) Dozers
- (d) Explain the various concrete production plants used in construction industries. 7

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B. E. (Sixth Semester) Examination, 2020

(Old Scheme)

(Civil Branch)

MODERN CONSTRUCTION MATERIALS

(Elective-I)

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory and carries 2 marks. Attempt any two parts from b, c and d of each question and carries 7 marks.

Unit-I

1. (a) Enumerate any two types of non-conventional concrete.

[2]

- (b) Explain the role of admixtures in manufacturing of HPC.
- (c) What is FRC? Explain the various types of Fibres used in FRC.
- (d) Explain the criteria for selecting the materials for making High Strength concrete.

Unit-II

- 2. (a) What is an alloy? Give example.
- (b) Write short notes on :
 - (i) High speed steel
 - (ii) Stainless steel
- (c) What is the difference between ferrous alloys and nonferrous alloys? Explain aluminum alloys briefly.
- (d) Explain the properties and uses of wrought iron.

Unit-III

- 3. (a) Define Polyesters.

[3]

- (b) Discuss :
 - (i) Creep and relaxation in plastics
 - (ii) Stress strain curve for plastics
- (c) What are the different types of fibre used in Fibre reinforced polymers? Explain brief.
- (d) Explain various Industrial and Civil engineering application of Fibre reinforced polymers.

Unit-IV

- 4. (a) What do you mean by water proofing compound?
- (b) Write short notes on :
 - (i) Waterproof membrane
 - (ii) Waterproof Asphalt paint
- (c) Explain the various Facade systems.
- (b) Write short notes on :
 - (i) Natural Flooring Material
 - (ii) Artificial Flooring Material

[4]

Unit-V

5. (a) What do you mean by piezoelectric materials?
- (b) What are shape memory alloys? How it works?
Where shape memory alloys are used?
- (c) Write short notes on :
- (i) Magneto-strictive materials
 - (ii) Electro-rheological fluid
- (d) What are smart materials? Write different applications of smart materials.

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B. E. (Sixth Semester) Examination, 2020

(Old Scheme)

(Civil Engg.)

ADVANCED CONCRETE TECHNOLOGY

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : All questions are compulsory with internal choices of two among (b), (c), (d) parts. IS-10262:2009 and IS-456:2000 is allowed.

Unit-I

1. (a) List out the name and abbreviation of Bogue's compounds. 2

[2]

- (b) Write short notes on Portland pozzolana cement. 7
- (c) Write short notes on hydration of cement and structure of hydrated cement. 7
- (d) Enumerate the test for determination of flakiness index of the aggregate with neat sketch. 7

Unit-II

2. (a) Draw a representative diagram of true, shear and collapse slumps. 2
- (b) What are the factors affecting workability of the concrete. 7
- (c) Write short notes on segregation and bleeding. 7
- (d) Write short note on shrinkage of the concrete. 7

Unit-III

3. (a) What do you understand by standard deviation of test results. 2
- (b) Explain about Schmidt's rebound hammer for non destructive testing of concrete. 7

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[3]

- (c) Explain the step by step procedure of concrete mix design by latest IS code method for any resumed grade of concrete. 7
- (d) What are the sampling and acceptance criteria of concrete? 7

Unit-IV

4. (a) What are the ingredients of fly ash concrete? 2
- (b) Explain about polymer concrete. 7
- (c) Explain about fiber reinforced concrete. 7
- (d) Explain about light weight concrete. 7

Unit-V

5. (a) Write down the various stages of manufacture of concrete. 2
- (b) Explain in brief about the various method adopted for transportation of concrete. 7
- (c) Explain about underwater concreting by Tremie method. 7

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(d) Explain in brief about the curing methods.

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B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engg. Branch)

STRUCTURAL ENGINEERING DESIGN-II

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory. Attempt any one part from (b) & (c) of each question. Also draw necessary diagrams. IS 800-2007 and Steel Table is permitted. Assume suitable data if required with relevance.

Unit-I

1. (a) What do you mean by serviceability limit and service criteria? 2

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- (b) Calculate the collapse load for the following cases; 14
- (i) Simply supported beam with concentrated load at centre
 - (ii) Simply supported beam with eccentric load
- (c) Find the shape factor for the following sections :
- (i) Square of side a with its diagonal parallel to the zz -axis.
 - (ii) Triangular section of base b and height h . 14

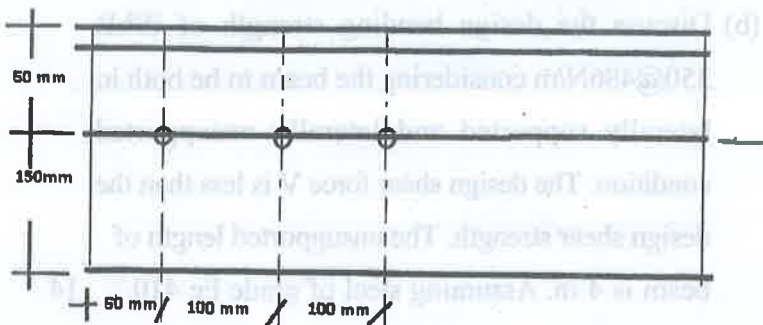
Unit-II

2. (a) What is 'Pitch' in bolt measurement? Draw the suitable diagram. 2
- (b) Two Indian standard flats 2 m long & 250 mm \times 10 mm size are jointed to make 4 m length. Design a butt joint with the bolts arranged in the diagonal pattern. The bolts are supported to carry a factored tensile force of 375 kN. Also determine the net tensile strength of main plate and cover plate. The steel and bolts are of Fe 410 and 4.6 respectively. 14

- (c) A tie member consisting of an ISA 80 mm × 50 mm × 8 mm (Fe 410 grade steel) is welded to a 12 mm thick gusset plate at site. Design welds to transmit load equal to the design strength of the member. 14

Unit-III

3. (a) What do you mean by slenderness ratio? 2
- (b) A tension member 1.2 m long is to resist a dead load of 35 kN and live load of 75 kN. Design the rectangular bar of Fe 410 grade steel. Use 4-6 grade, 20 mm diameter bolt in one line. 14
- (c) The 200 × 100 × 15 mm angle shown in the figure is connected with three 20 mm, 4-6 grade bolts. Calculate the design tensile strength and comment on the results. 14



Unit-IV

4. (a) What is the difference between lacing and battening element? 2
- (b) Write the steps for design of axially loaded compression members with suitable discussion. 14
- (c) Design a built up column consisting of two channel sections placed toe to toe with a clear spacing of 250 mm between them. The column carries an axial load of 1080 kN and is having an effective height of 10 m. Design the lacing for the column. 14

Unit-V

5. (a) What are the possible situations of web buckling of beam member? 2
- (b) Discuss the design bending strength of ISLB 350@486N/m considering the beam to be both in laterally supported and laterally unsupported condition. The design shear force V is less than the design shear strength. The unsupported length of beam is 4 m. Assuming steel of grade Fe 410. 14

[5]

(c) Design a laterally unsupported beam for the following data : 14

- (i) effective span = 4 m
- (ii) Max BM = 450 kN-m
- (iii) Max SF = 220 kN,
- (iv) Grade of steel is Fe 410.

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Roll No. :

320652(20)

B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engg. Branch)

GEOTECH ENGINEERING-II

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory. Attempt only two parts from (b), (c) and (d).

Unit-I

1. (a) Define infinite and finite slope. 2
- (b) Explain stability analysis of infinite slopes for cohesive soil. 7

[2]

- (c) Analyze the slope of infinite extent having slope angle = 25° , is made of clay having $C' = 30 \text{ kN/m}^2$, $\phi' = 20^\circ$, $e = 0.65$ and $G_s = 2.7$ under the following conditions : 7
- (i) When the soil is dry,
- (ii) When water seeps parallel to the surface of the slope; and
- (iii) When the slope is submerged.
- (d) Explain Swedish circle method. 7

Unit-II

2. (a) What is lateral earth pressure? 2
- (b) A 5 m high rigid retaining wall has to retain a back fill of dry cohesionless soil having the following properties : $\phi =$ Angle of internal friction = 30° , $e =$ void ratio = 0.74, $G_s =$ specific gravity = 2.68, coefficient of friction = 0.36. Determine the magnitude and point of application of the resultant thrust. 7

[3]

- (c) Explain Poncelet method. 7
- (d) Explain different cases of cohesionless backfill. 7

Unit-III

3. (a) What is soft footing? 2
- (b) Explain plate load test. 7
- (c) The result of two plate load tests for a settlement of 25.4 mm are given :

Plate diameter	Load
0.305 m	31 kN
0.61 m	65 kN

A square column foundation is to be designed to carry a load of 800 kN with an allowable settlement of 25.4 mm. Determine the size of footing by using Housel method. 7

- (d) Write short notes on : (any two) 7
- (i) Rectangular combined footing
- (ii) Mat footing
- (iii) Spread footing

Unit-IV

4. (a) What is well foundation? 2
- (b) In a 16 pile group. The pile diameter is 45 cm and center to center spacing of the square group is 1.5 m. If $C = 50 \text{ kN/m}^2$, determine whether the failure would occur with the pile acting individually or as a group? Neglect bearing at the tip of the pile. All piles are 10 m long. Take $m = 0.7$ for shear mobilisation around each pile. 7
- (c) What are the different shape of wells? Discuss the characteristics of each type. 7
- (d) Explain the classification of piles foundation. 7
- Unit-V**
5. (a) What do you mean by CNS soils? 2
- (b) What are preventive measures for expansive soil? 7
- (c) What do you understand by under-seamed piles, explain with sketch? 7
- (d) What is an expansive soil? Where is it found in India? What are its generally characteristics? 7

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Roll No.

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B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engg. Branch)

ENVIRONMENTAL ENGINEERING-I

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) of each question is compulsory carries 02 marks. Attempt any two parts from (b), (c) & (d) carries 7 marks each.

Unit-I

1. (a) Enumerate the 5 factors governing the selection of a particular source of water for a water supply project.

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- (b) Explain (i) the various surface sources and underground sources. (ii) Type of intake works for a water purification plant.

The following data shows the variation in population of a town from 1962 to 2012. Estimate the population of the city in the year 2042. Use 3 methods :

Year	Population
1962	65,000
1972	73,000
1982	1,01,500
1992	1,34,000
2002	1,67,000
2012	2,32,000

- (c) Discuss the merits and demerits of river water sources and ground water source for the water supply scheme for a town. Compare the advantages and disadvantages of ground / water supply and surface water supply schemes.
- (d) From the census data given below, estimate the population of the city for the year 2000 A.D.

Year	Population
1940	22610
1950	13851
1960	36640
1970	45520
1980	53460
1990	63210
2000	70320
2010	76540

Unit-II

2. (a) Name 4 coagulants and their chemical formulae.
- (b) Explain the significance of the following in drinking water :
- Ammonia
 - Chloride content
 - Methane gas
 - Coliforms
- (c) Water works of a town is provided with sedimentation tank of size $40 \times 15 \times 3.5$ m. If 115 ppm suspended solids are present in the water and 60%

| 4 |

are removed in the basin, and the average specific gravity is 2.1, determine the following, if 8.5×10^6 litres of water is treated daily.

- (i) Detention time,
 - (ii) Average flow of water through the tank.
 - (iii) Deposition of the solids in the tank.
 - (iv) Overflow rate.
- (d) Water works of a town treat 25×10^6 l/day. Quantity of filter alum consumed is 21 mg/l. If raw water has an alkalinity of 4.6 mg/l of CaCO_3 , determine the amount of filter alum and quick lime (containing 80% of quicklime) required annually at the water works.

Unit-III

3. (a) (i) Write the formula for chloramines.
(ii) What is the theory of filtration?
- (b) Explain the Horizontal Gravity Pressure filter with a neat sketch.
- (c) Explain the role of chlorine as disinfectant. Also name for dechlorination agents.

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- (d) Explain the function of bleaching powder as disinfectant. It is required to treat 5×10^6 litres of water with 0.4 mg/litre of chlorine. If the disinfectant is in the form of bleach that contains 35% of available chlorine, how many kg of bleaching powder are needed to treat the daily flow of water?

Unit-IV

4. (a) What are the deciding factors in determining the storage capacity of service reservoirs?
- (b) Explain the types of fire hydrants with appropriate sketches.
- (c) Explain any two methods of removing permanent hardness in water.
- (d) Design a water softening plant for a water works having the following data :
- (i) Hardness in the water = 450 mg/litre as CaCO_3
 - (ii) Quantity of water to be treated = 22000 litre/hour
 - (iii) Allowable hardness after treatment in the work = 75 mg/litre as CaCO_3
 - (iv) Ion exchange capacity of the resin to be used in the plant = 10 kg of hardness/cu m

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(v) Salt required for regeneration of the resin =
55 kg/cuM of the resin

The water softening plant works for 2 shifts of 8 hours per day. Assume any suitable data where necessary.

Unit-V

5. (a) Mention the causes of Air Pollution.
- (b) Explain the effects on air pollution on plants and livestock.
- (c) Describe any two precleaning devices to control air pollution (with neat sketches).
- (d) What are the various air pollution control methods? Describe any 3 major air pollution control equipments.

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B. E. (Sixth Semester) Examination, April–May 2020

(New Scheme)

(Civil Engg. Branch)

CONCRETE TECHNOLOGY

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) is compulsory and solve any two parts from (b), (c) and (d) in each question.

Unit-I

1. (a) Give classification of cement. 2
- (b) What are the role of gypsum and calcium chloride in cement? 7
- (c) Explain in detail hydration of cement. 7

[2]

- (d) How aggregates are classified on the basis of size? 7

Unit-II

2. (a) What do you understand by admixtures? 2
(b) Write short note on - ground granulated blast, furnace slag (GGBFS). 7
(c) What are the effect of mineral admixtures on fresh concrete and hardened concrete. 7
(d) Explain in detail the properties of fresh concrete. 7

Unit-III

3. (a) What do you understand by hardened concrete? 2
(b) What do you understand by compressive strength of concrete. 7
(c) Discuss the factors affection the variability of concrete and strength. 7
(d) Describe the relation between durability and permeability of concrete. 7

Unit-IV

[3]

4. (a) What do you understand by concrete mix design? 2
(b) What are the various factors to be considered in proportion of concrete mix design. 7
(c) Explain British method of mix design. 7
(d) Explain "Rebound Hammer Test" for measuring the surface hardness of concrete. What are the limitations of this test. 7

Unit-V

5. (a) What do you understand by special concrete? 2
(b) Explain the process of making light weight concrete. 7
(c) Explain uses of foam concrete and gas concrete. 7
(d) What are the functors affecting properties of FRC. 7

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B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engg. Branch)

CONSTRUCTION PLANNING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : (i) Answer all questions. Part (a) of each question is compulsory. Attempt any two parts from (b), (c) and (d) of each question.

(ii) The figures in the right hand margin indicate marks.

Unit-I

1. (a) What is Planning? 2
- (b) What are the methods of scheduling? Explain with the help of a suitable example. 7

[2]

- (c) What do you mean by LOB technique? 7
- (d) What do you understand by Job Layout? What are the factors affecting the job layout? 7

Unit-II

- 2. (a) What is slack? 2
- (b) What do you mean by PERT? What is its significance? 7
- (c) How the probability of completion time for a project can be determined? Write the steps involved in it. 7
- (d) What are the advantages and disadvantages of network analysis over other technique? 7

Unit-III

- 3. (a) What is a critical path? 2
 - (b) What do you mean by earliest event time and latest event time? Formulate the equation for them. 7
 - (c) The following table gives the activities in a Construction Project and other relevant information : 7
- | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|
| Activity | 1-2 | 1-3 | 2-3 | 2-4 | 3-4 | 4-5 |
| Duration | 20 | 25 | 10 | 12 | 6 | 10 |

[3]

- (i) Draw the Network for the project
- (ii) Find the critical path
- (iii) Find free float, total float and independent float for each activity
- (d) Differentiate between CPM and PERT. 7

Unit-IV

- 4. (a) What are Resource allocation? 2
- (b) What are the necessary data required for updating? Also draw the flowchart for updating. 7
- (c) What do you mean by resource smoothing? What are the steps involved for doing the resource smoothing? 7
- (d) Explain the term updating. Why is it necessary? 7

Unit-V

- 5. (a) Define TQM. 2
- (b) Explain the basic elements of quality with a flow diagram. 7

- (c) Explain the use of documentation and quality control circles in construction quality management. 7
- (d) Describe in detail, the operation and application of the following types of excavating equipment with line-diagram showing the basic parts :
- (i) Power shovel
- (ii) Backhoe 7

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B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engg. Branch)

WATER POWER ENGINEERING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : For every question (a) is compulsory which carries 2 marks and attempt any two questions from (b), (c) & (d) which carries 7 marks each.

Unit-I

1. (a) Write two factors on which the development of power from flowing water depends. 2
- (b) Discuss the strengths, weakness and future prospects of water power in India. 7
- (c) Give a brief comparison between hydro, thermal and nuclear power in minimum 7 points. 7

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- (d) Discuss the relation of water power and hydrology. 7

Unit-II

2. (a) What is pondage? 2
(b) Explain the graphical representation for stream flow analysis. 7
(c) Discuss the storage capacity of reservoir by Masscurve methods with formula to support the answer. 7
(d) What is Runoff and write the factors affecting runoff. 7

Unit-III

3. (a) What is a pumped storage plant? 2
(b) Explain the classification of hydropower plant based on design features. 7
(c) What is a diversion canal plant? How the head of diversion canal plant can be developed by general procedure. Explain. 7
(d) Explain how tidal power is generated and write the advantages and disadvantages of tidal power plant. 7

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Unit-IV

4. (a) What is a water hammer? 2
(b) Write the design criteria for penstockes and write about methods of support to penstocks. 7
(c) What do you mean by economical diameter of penstock and explain the methods used to determine the size/diameter of the penstock 7
(d) What is a surge tank? Write the necessity and types of surge tanks. 7

Unit-V

5. (a) Write the basic objective of power house planning. 2
(b) Write about three main divisions of a hydro-power station structure with a neat sketch to support your answer. 7
(c) Describe the various locations of underground power stations and write the advantages of the underground power house. 7
(d) Write the components of underground power house

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and draw and mention types of layout for underground power house.

7

Unit-V

- (a) Write the basic objective of power house planning.
- (b) Write about three main divisions of a hydro-power station structure with a neat sketch to support your answer.
- (c) Describe the various locations of underground power stations and write the advantages of the underground power house.
- (d) Write the components of underground power house.

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B. E. (Sixth Semester) Examination, April-May 2020

(New Scheme)

(Civil Engineering Branch)

EARTHQUAKE ENGINEERING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of all the question are compulsory carrying 2 marks while answer any two parts from (b), (c) and (d) carrying 7 marks each.

1. (a) Zone factor generally represents :

(i) Seismicity of a region

(ii) Importance of the structure

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- (iii) Size of structure
 - (iv) None of these
- (b) Derive the motion equation for the forced undamped vibration.
- (c) Derive the motion equation for the free damped vibration.
- (d) Explain seismic surface waves with schematic diagrams.
2. (a) Generally damping for steel structure is taken as :
- (i) 5% of critical damping
 - (ii) 2% of critical damping
 - (iii) 10% of critical damping
 - (iv) 20% of critical damping
- (b) List the four virtues of good earthquake resistance design and describe any one in detail.
- (c) List and sketch the earthquake resistance feature of ordinary brick masonry structure.
- (d) Explain earthquake design philosophy for buildings.

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3. (a) Generally Intensity of earthquake :
- (i) Increase away from the epicenter
 - (ii) Remains constant
 - (iii) Decreases away from the epicenter
 - (iv) None of these
- (b) Explain soft storey? Explain how soft storey problems can be eliminated in the existing buildings.
- (c) Explain how ductile design is helpful for better earthquake resistance.
- (d) Derive the equation of motion and its solution for forced undamped vibration system.
4. (a) Earthquake is classified as shallow focus if focal depth is :
- (i) Less than 70 km
 - (ii) Less than 7 km
 - (iii) Less than 14 km
 - (iv) Less than 700 km
- (b) Write short note on Liquefaction and remedial measures.

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- (c) Describe various strengthening methods for RCC columns and beams through illustrative sketches.
 - (d) Explain the term in detail “Peak Ground Acceleration”.
5. (a) Maximum intensity scale based on MSK scale is :
- (i) X
 - (ii) V
 - (iii) XI
 - (iv) XII
- (b) Discuss the behavior of the following masonry walls in seismic regions :
- (i) Reinforced Masonry wall
 - (ii) Infill masonry wall
- (c) Explain failures of masonry structures observed in past earthquakes and how will you improve performance of masonry building.
- (d) Draw the detailed sketch of :
- (i) Different ways of beam jacketing as IS code &
 - (ii) Placing of vertical bars and closed ties in columns as per IS code