Hall Ticket Number :										

Code: 4G644

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Building planning and Drawing

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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PART-A

Answer *all* ***Three*** units by choosing one question from each unit (3 x 14 = 42 Marks)

UNIT–I

1. a) What are provisions for (i) off-sets (ii) size of rooms

   b) Write short notes on building bye-law, bringing out out their merits and merits vis-à-vis their implementation

OR

2. a) What are the objectives of building bye-laws?When do you apply the building bye-laws

   b) What is floor space Index? Expalin its practical significance in construction

UNIT–II

3. a) Describe the various types of residential buildings

   b) What are the requirments for the following rooms in planning of residential building (**i**) Dining room (**ii**) Kitchen (**iii**) Drawing room

OR

4. a) Describe the important departments and facilities to be provided in the layout of a general hospital

   b) Explain the various planning factors in the design of a school building

UNIT–III

5. a) Differentiate between

      (i) CPM and PERT

      (ii) Float and Slack

      (iii) Activity and event

   b) What do you understand by term planning of construction projects and explain clearly about factors involved in the project

OR

6. a) Explain the concept of Float. Distinguish clearly between free and independent floats

   b) What is a network? What are the different types of network scheduling? Illustrate with example

PART-B

Answer *any* **one** question from the following units (1 x 28 = 28 Marks)

UNIT–IV

7. a) Draw conventional signs for the following materials

(i) Rock (**ii**) Plaster (**iii**) Lead (**iv**) Glass

(b) Draw the front elevation of a fully paneled wooden of size 900X 2100 mm. Also show the sectional plan

OR

UNIT–V

8. The plan of a residential building is as shown in fig. A-1. The dimensions are clear inner ones.

Specifications:

Foundation: All the walls are taken 900 mm below the ground level.
Concrete footings are 300 mm thick of 1:3:6 c.c., 800 mm wide.

Basement: Height of basement is 600 mm above G.L.; Walls are 300 mm thick of brick work in c.m. 1:6.

Superstructure: All walls are of bricks 200 mm thick in c.m. 1:6.
Clear head room is 3000 mm.

Roof: Roof is 100 mm thick 1:2:4 R.C.C. slab. Weathering coat of flat tiles of 2 layers, 25 mm thick is laid over it.

Flooring: Flooring is 150 mm thick c.c. of 1:4:8 finished with 10 mm thick c.m. 1:3.

D_1	Panelled door	900 mm × 2100 mm
D_2	Panelled door	750 mm × 1800 mm
W	Glazed window	1200 mm × 1400 mm
V	Ventilator	750 mm ×450 mm

Sunshades project 500 mm beyond the wall face.

Draw: (**i**) Neat dimensioned plan; (**ii**) Section along AB

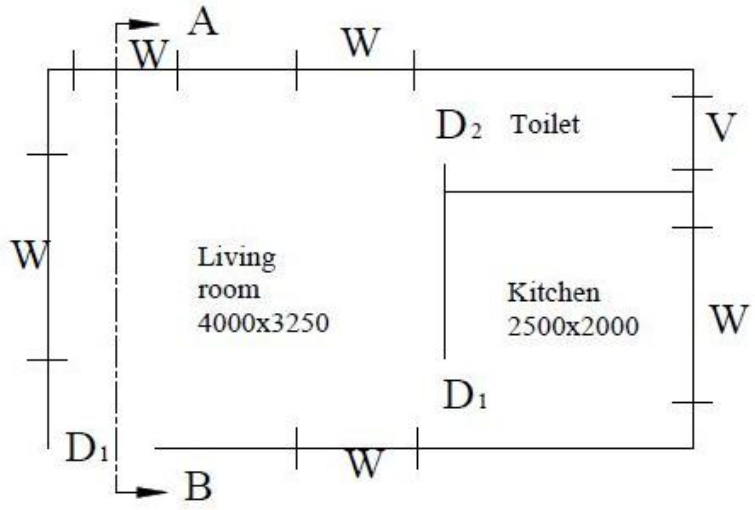

Fig. A1

All dimensions are in mm

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Hall Ticket Number :										

Code: 4GC43

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Environmental Science

(Common to CE, ME and CSE)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the components of environment and their major interactions?
   b) Write a brief note on "Global Environmental Crisis"

OR

2. a) Explain the multi disciplinary nature of Environmental Studies?
   b) Describe the impact of over-exploitation of natural resources?

UNIT–II

3. a) Explain the environmental impacts of deforestation?
   b) Explain the adverse environmental impacts of modern agriculture?

OR

4. a) Compare various types of energy with respect to its suitability for Indian conditions?
   b) Discuss various types of land degradation with its causes and remedial measures?

UNIT–III

5. a) Explain role of producers, consumers and decomposers in an ecosystem
   b) Explain the components and functions of a Forest ecosystem

OR

6. a) Describe the importance and values of biodiversity?
   b) Explain in-situ and ex-situ conservation of biodiversity with examples

UNIT–IV

7. a) Enumerate major air pollutants and explain their effects on human beings
   b) Describe various sources of marine pollution. How can you prevent pollution of our oceans?

OR

8. a) Discuss major causes and effects of soil pollution
   b) Explain the process of composting as applied for the management of Solid Waste Management

UNIT–V

9. a) Explain the acid rain and its impacts. How can we avoid it?
   b) Explain environmental problems posed by population explosion?

OR

10. a) Discuss salient features of Air (prevention and control of pollution) Act, 1981
    b) Explain the term "human rights". What is the status of human rights in India?

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Hall Ticket Number :										

R-14

Code: 4G642

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Hydraulics and Hydraulic Machinery

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the phenomenon of boundary layer separation.

   b) A smooth square plate of 2m side is kept immersed in water which moves with a velocity of 30cm/s. Find the thickness of the boundary layer at a distance of 0.5m from the leading edge. Take kinematic viscosity of water as $1.0X10^{-6}$ m^2/s.

OR

2. Define displacement and momentum thickness. Also find the same for velocity distribution in boundary layer given by $u/U=2(y/\delta)-(y/\delta)^2$.

UNIT–II

3. a) A trapezoidal channel with side slopes of 2 horizontal to 1 vertical has to carry a discharge of $20m^3/s$. If the bottom width is 4m calculate the bottom slope required to maintain a uniform flow at a depth of 1.5m. Take Maning's n= 0.015.

   b) What are critical, subcritical and super critical flows?

OR

4. a) What are H-curves and A-curves?

   b) Derive dynamic equation for GVF.

UNIT–III

5. The rotor of an inward flow hydraulic turbine has a diameter over the tips of the blades of 1m. The diameter at the bottom of the blades is 0.6m. The speed is 300r.p.m. The water is supplied through fixed vanes at 10^0 to the tangent to the outer circumference of the rotor the velocity of water being 10m/s. Find the blade angles at entry and exit so that the water may enter and leave the moving blades without shock, the water leaves the blades with the velocity entirely radial and equal to 3.5m/s. Also find the velocity of the water relative o the blades at the exit.

OR

6. A jet of water moving at 15m/s impinges on a symmetrical concave vane shaped to deflect the jet through 140^0. If the vane is moving at 6m/s find the angle of the jet so that there is no shock at inlet. Also determine the absolute velocity of exit in magnitude and direction and the work done per unit weight of water.

UNIT–IV

7 a) What is draft tube theory?

b) Two jets strike the buckets of a Pelton wheel which is having shaft power as 15450 kW. The diameter of each jet is given as 200mm. If the net head on the turbine is 400m find the overall efficiency of the turbine. Take c_v=1.0.

OR

8. a) A turbine develops 500kW power under a head of 100m at 200r.p.m. what would be its normal speed and output under a head of 64m.

b) Give the causes and effects of cavitation with respect to turbines.

UNIT–V

9. A centrifugal pump has external and internal impeller diameters as 600mm and 300mm respectively. The vane angle at inlet and outlet are 30^0 and 45^0 respectively. If the water enters the impeller at 2.5m/s find speed of the impeller in r.p.m and work done per kN of water.

OR

10. a) A run-of-river hydel power plant with an installed capacity of 15000kW operates at 20% load factor when it serves as a peak load station. What should be the minimum discharge in the stream so that it may serve as the base load station? The plant efficiency may be taken as 80% when working under a head of 15m. Also calculate the maximum load factor of the plant when the discharge in the stream is $30m^3/s$.

b) List out various types of hydro power plants. Explain any one type.

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Hall Ticket Number :										

Code: 4GC42

R-14

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Probability and Statistics

(Common to CE, ME & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1 a) In a group there are 3 men and 2 women. Three persons are selected at random from this group. Find the probability that one man and two women or two men and one women are selected. 7M

b) A random variable X has the following probability function:

X	1	2	3	4	5	6
P(X)	K	3K	5K	7K	9K	11K

Determine **i**) K. **ii**) Expectation. **iii**)Variance. 7M

OR

2. a) Two cards are selected at random from 10each numbered 1 to 10.
Find the probability that the sum is even if
i) The two cards are drawn together
ii) The two cards are drawn one after other with replacement. 7M

b) For the continuous random variable X whose probability density function is given by $f(x) = \begin{cases} cx(2-x), if\ 0 \leq x \leq 2 \\ 0, otherwise \end{cases}$ where c is a constant. Find *c*, mean and variance of X. 7M

UNIT–II

3. a) If the masses of 300 students are normally distributed with mean 68 kgs and deviation 3 kgs, how many students have masses
(i) Greater than 72 kg.
(ii) Less than or equal to 64 kg.
(iii) Between 65 and 71 kg inclusive. 7M

b) 10 % of screws produced by a company are defective. Find the probability that out of 10 screws chosen at random
(i) 1 will be defective
(ii) at most 2 will be defective
(iii) none will be defective. 7M

OR

4. a) In a normal distribution 31% of the items are under 45 and 8% of the items are over 64. Find the mean and variance of the distribution. 7M

b) A hostel switch board receives an average of 4 emergency calls in a 10 minute interval. What is the probability that
(i) There are at most two emergency calls.
(ii) Exactly 3 emergency calls, in a 10 minutes interval. 7M

UNIT–III

5. a) Write the short note on Test of hypothesis. 7M

b) A manufacturer claimed that at least 95% of the equipment which he supplied to a factory conformed to specifications. An examination of a sample 200npieces of equipment revealed that 18 were faulty. Test his claim at 5% level of significance. 7M

OR

6. a) Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favor of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same, at 5%. 7M

b) The mean yield of wheat from a district A was 210 pounds with S.D 10 pounds per acre from a sample of 100 plots. In another district the mean yield was 220 pounds with S.D 12 pounds from a sample of 150 plots. Assuming that the S.D of yield in the entire state was 11 pounds, test whether there is any significant difference between the mean yields of crops in the two districts. 7M

UNIT–IV

7. a) The mean life time of a sample of 25 fluorescent light bulbs produced by a company is computed to be 157 hours with S.D of 120 hours. The company claims that the average life of the bulbs is 1600 hours using the level of significance of 0.05. Is the claim acceptable? 7M

b) From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees.

	Employees				
Soft drinks		Clerks	Teachers	Officers	Total
	Pepsi	10	25	65	100
	Thumps up	15	30	65	110
	Fanta	50	60	30	140
	Total	75	115	160	350

7M

OR

8. a) A mechanist is making engine parts with axle diameters of 0.7000 inches. A random sample of 10 parts shows a mean diameter of 0.742 inch, with S.D of 0.04 inch. Compute the statistic you would use to test whether the work is meeting the specifications at 0.05 level of significance. 7M

b) Two random samples have the following results.

Sample	Size	Sample mean	Sum of square of deviations from the mean
1	10	15	90
2	12	14	108

Test whether the samples came from the same normal population. 7M

UNIT–V

9. a) Give the comparison of $\bar{x}$ and R charts with P-chart. 7M

b) A self-service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes while the cashier can serve 10 customers in 5 minutes. Assuming Poisson distribution for arrival rate and exponential distribution for service time, find

i) Average number of customers in the system.

ii) Average number of customers in the queue or average queue length.

iii) Average time a customer spends in the system.

iv) Average time a customer waits before being served. 7M

OR

10 a) In a manufacturing process the number of defectives found in the inspection of 15 lots of 400 items each are given below:

2,5,0,14,3,0,1,0,18,8,6,0,3,0 and 6.

i) Determine the trial control limits and state whether the process is in control.

ii) What will be the corresponding control limits of some obvious points outside the control limits are eliminated? Examine whether the process is still in control or not. 7M

b) Derive average number of customers and average length of queuing system. 7M

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Hall Ticket Number :										

Code: 4G643 **R-14**

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Structural Analysis-I

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. A fixed beam carries a point load at midpoint of the beam. Find the expression of deflection at any point and maximum deflection. 14M

OR

2. An UDL of load 1850 N/m is placed on a fixed beam AB of length 6m by which support B sinks by 1.4 cm. Assume E and I values as $2x10^6$ n/mm^2 and 10000 cm^4. Determine the fixing end moments at A and B. 14M

UNIT–II

3. A continuous beam ABC consists of spans AB and BC of lengths 3m and 4m respectively, the ends A and C being simply supported. If the span AB and BC carry uniformly distributed loads of 60kN/m and 50KN/m respectively. Determine the support moments at A, B and C. Draw S.F and B.M diagrams. The moment of inertia for the spans AB and BC are I and 2I respectively. 14M

OR

4. Derive the clayperon`s theorem of three moments. 14M

UNIT–III

5. A continuous beam ABCD is fixed at A and simply supported at B, C and D. The beam consists of spans AB = 5.5 metres, BC = 6.6 metres, CD = 4.4 metres and overhang DE = 2 metres. It carries a uniformly distributed load of 10 kN per metre on AB, a point load of 6 kN at the middle of BC, a point load of 8 kN on CD at 1 metre from C and a uniformly distributed load of 2 kN per metre on the overhang DE. If $I_{ab} : I_{bc} : I_{cd} = 2 : 2 : 1$, Calculate the maximum bending stress caused by settlement of supports A by 6 mm, B by 12 mm and C by 6 mm using moment distribution method. 14M

OR

6. a) Analyze a continuous beam of span 11 m fixed at one end and carries a UDL of 10kN/m for a span of 5 m from the support and a point load of 40kN at the mid span of reaming position, supports are provided at a distance of 5 and 11 m from the fixed end respectively. Use slope deflection method. 10M

   b) Why is slope deflection equation method known as stiffness method? 4M

UNIT–IV

7. A Simply supported beam AB of length L loaded with UDL w/unit length over the whole span. Using Castigliano`s first theorem, determine the deflection of beam at the centre. 14M

OR

8. A simply supported girder has a span of 12metres a 200kn wheel load moves from one end to the other end on the span of the girder find the maximum bending moment which can occur @ a section of 4mts from the left end. 14M

UNIT–V

9. a) How will you obtain degree of static determinacy? Explain. 7M

   b) What are the uses of influence line diagrams? 7M

OR

10. Derive the influence diagram for reactions and bending moment at any section of a simply supported beam. Using the ILD, determine the support reactions and find bending moment at 5m, 6m and 7m for a simply supported beam of span 12m subjected to three point loads of 25kN, 35kN and 5kN placed at 1.5m, 4.5m and 6.5m respectively. 14M

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Hall Ticket Number :										

R-14

Code: 4G641

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2016

Strength of Materials-II

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) A thin cylindrical shell of 120cm diameter,1.5cm thick and 6m long is subjected to internal fluid pressure of 2.5 N/mm^2. If the value of E=2×10^5 N/mm^2 and Poisson's ratio =0.3, calculate (**i**) Change in diameter (**ii**) Change in length. 8M

   b) Derive an expression for circumferential stress for a thin spherical shell of internal diameter d, wall thickness t, is subjected to an internal pressure 'p'? 6M

OR

2. Calculate the thickness of the metal necessary for a cylindrical shell of internal diameter 80mm to with stand an internal pressure of 25 N/mm^2, maximum permissible tensile stresses is 125 N/mm^2 14M

UNIT–II

3. Derive the expression for equivalent torque when shaft is subjected to combined bending & torsion 14M

OR

4. A closely coiled helical spring of round steel wire 8 mm in diameter having 10 complete turns with a mean diameter of 10cm is subjected to an axial load of 250N. Determine (**i**) the deflection of the spring (**ii**) maximum shear stress in the wire and (**iii**) stiffness of the spring .Take C= 8 × 10^4 N/mm^2. 14M

UNIT–III

5. Derive the expression for maximum bending moment for a long column subjected to eccentric loading. 14M

OR

6. A hollow cylindrical cast iron column is 4m long with both ends fixed. Determine the minimum diameter of the column, if it has to carry a safe load of 250KN with a factor of safety 5.Take the internal diameter as 8 times the external diameter and $\alpha = \frac{1}{1600}$ in Rankine's formula and σ_c=550MN/m^2. 14M

UNIT–IV

7. A hollow steel column of square section of side 450mm and thickness of the section is 25mm .The column carries an eccentric load 'P' at an eccentricity of 'e'. If the extreme compressive stress induced in the section is 25 N/mm^2 at one end and 75 N/mm^2 at the other end, determine the value of 'P' and 'e'. 14M

OR

8. a) How will you find the maximum and minimum stresses at the base of a symmetrical column, when it is subjected to load which is eccentric to both axis? 7M

   b) A load of 75 KN is carried by a column made of cast iron. The external and internal diameters are 200mm and 180mm respectively. If the eccentricity of load is 35mm, find the maximum and minimum stress intensities. 7M

UNIT–V

9. Derive the expression of bending stress and inclination of neutral axis for a beam subjected to unsymmetrical bending 14M

OR

10. A beam of rectangular section 100 mm wide and 150mm deep is subjected to bending moment of 15 KNm. The trace of the plane of loading is inclined at 45^0 to the Y-Y axis of the section. Locate the neutral axis of the section and calculate maximum bending stress induced in the section 14M

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