Hall Ticket Number :										

R-14

Code: 4G644

II B.Tech. II Semester Supplementary Examinations May 2019

Building Planning & Drawing

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

PART-A

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

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UNIT–I

1. a) Explain the importance of wall thickness in byelaws of buildings 7M
   b) Explain the consideration of the height of buildings as per building bye-laws? 7M

OR

2. a) List out different purposes of rooms in a residential building? 7M
   b) Explain the standard requirements of the following in a residential building. i) Bed Room ii) Drawing cum Dining Room 7M

UNIT–II

3. With the help of sketches explain the principles concerned with the planning of (a) Theatre (b) Hospitals 14M

OR

4. a) Explain the objectives of building byelaws? 7M
   b) Explain the principles of building byelaws? 7M

UNIT–III

5. a) Differentiate between PERT and CPM network methods 7M
   b) Define a dummy activity used in a network. State the Two purposes for which it is used. Mention four conventions that are used in drawing the network. 7M

OR

6. a) Explain bar charts. Give the draw backs of bar charts 7M
   b) Explain scheduling and monitoring of a project 7M

PART-B

Answer *any One Question from the following* units (1 x 28 = 28 Marks)

UNIT–IV

7. a) Draw the plans of Flemish Bond odd and even courses of one and half brick walls in thickness at the junction of a corner (300mm thickness). 18M
   b) Draw neat conventional signs for the following items (in 40mm*40mm blocks). (i) Glass (ii) Earth (iii) Aluminum (iv) Steel. 10M

OR

UNIT–V

8. The line sketch of the plan of a residential building is shown in below Figure. Draw (i) A neat dimensioned plan (ii) Sectional elevation along A-A. Specifications: Foundation: CC 1:3:6, 300 mm wide thick and 1200 mm wide, depth of foundation is 1000 mm below the ground level. Basement-coarse Rubble Masonry: 400 mm wide and 700 mm high Superstructure: Brickwork in CM 1:6, 300 mm wide and 300 mm high ROC roofing: 100 mm thick. Provide door, windows, ventilators, lintels and sunshades as per standard dimensions. 28M

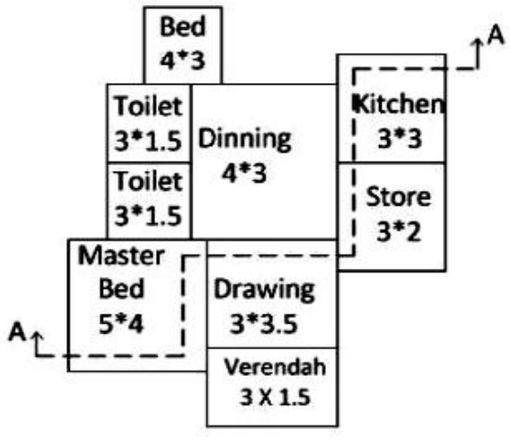

Figure 1

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Hall Ticket Number :										

R-14

Code: 4GC43

II B.Tech. II Semester Supplementary Examinations May 2019

Environmental Science

(Common to CE & ME)

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) What is mean by environmental studies? Explain its importance. 7M
   b) Write the need of environmental studies. 7M

OR

2. a) Write about the scope of Environmental Studies. 7M
   b) List out different disciplines involved with environment. Explain? 7M

UNIT–II

3. a) Write a brief note on renewable e energy sources. 7M
   b) Explain briefly about the water resources. 7M

OR

4. Explain the advantages and disadvantages of construction of dam buildings. 14M

UNIT–III

5. a) Define ecosystem. Explain different components of an ecosystem. 7M
   b) Explain about the formation of carbon cycle. 7M

OR

6. a) Discuss the structure and functions of grassland ecosystem. 7M
   b) Write about the value of biodiversity. 7M

UNIT–IV

7. a) Explain the causes and control measures of Air pollution. 7M
   b) Define Water pollution. Discuss in brief account on causes and effects of Water pollution 7M

OR

8. a) Define Noise pollution. Explain the causes and effects of noise pollution. 7M
   b) Describe about the Marine pollution. 7M

UNIT–V

9. a) Discuss the salient features of Wildlife (Protection) Act, 1972. 7M
   b) Write a note on environmental protection act. 7M

OR

10. a) Define watershed management and explain its objectives. 7M
    b) Explain briefly impact of population explosion on environment. 7M

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Hall Ticket Number :										

R-14

Code: 4G642

II B.Tech. II Semester Supplementary Examinations May 2019

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) The velocity distribution in the boundary layer is given as

$$\frac{v}{V} = \frac{3}{2}\frac{y}{¢} - \frac{1}{2}\left(\frac{y}{¢}\right)^2$$ Compute (δ^*/δ) and (θ/δ) 7M

   b) Explain the methods of controlling the boundary layer. 7M

OR

2. a) Explain the development of boundary layer on a curved plate. What is separation of boundary layer? 7M

   b) A cloth banner 3 m wide and 0.8 m high, meant for advertisement is mounted on poles. Calculated the net force acting on the banner when wind blows at 50 km/h. Assume C_D= 1.1, ρ = 1.25 k/m^3. If a number of holes are punched on the cloth how would the result change and why? 7M

UNIT–II

3. a) Design a Polavaram Right Main Canal for a discharge of 390 cumecs. The canal is Concrete lined (rough finish n = 0.018) to carry 20 m^3/s on a slope of 1/20000. Consider the hydraulically efficient trapezoidal shape. Take side slope as 1.5 :1. Bed level of the canal is 32.888 m. 7M

   b) Explain the various surface profiles of a gradually varied flow with sketches. 7M

OR

4. a) With neat sketches calculate the cross sectional area, wetted perimeter and hydraulic radius for common open channels, (Square, Triangle, Trapezoidal and Circular). 7M

   b) A trapezoidal channel having bottom width 6 m, side slope 2 horizontal to 1 vertical, Manning's roughness coefficient 0.025, and bottom slope 0.0016 carries a discharge of 10 m^3/s. Compute the back water profile created by a dam which backs up the water to a depth of 2 m immediately behind the dam. Use direct step method for computation. 7M

UNIT–III

5. a) Find the expression for force exerted by a fluid jet striking a symmetrical moving curved vane at the center. Also find the condition for maximum efficiency and show that the maximum efficiency is equal to 8(1+cosθ)/27. 7M

   b) A jet of water having a velocity of 28 m/s, strikes a series of radial curved vanes mounted on a wheel which is rotating at 285 r.p.m. The jet makes an angle of 32^o with the tangent to the wheel at inlet and leaves the wheel with a velocity of 4 m/s at an angle of 120^o to the tangent to the wheel at outlet. Water is flowing from outward in a radial direction. The outer and inner radii of the wheel are 0.6 m and 0.3 m respectively. Determine the i) vane angles at inlet and outlet; ii) work done per unit weight of water; iii) efficiency of the wheel. 7M

OR

6. a) Show that the force exerted by a jet of water on an inclined fixed plate in the direction of the jet is given by, $Fx = \rho a V^2 \sin^2\theta$. 7M

   b) A jet of water having a velocity of 15 m/s strikes a curved vane which is moving with a velocity of 5 m/s. The vane is symmetrical and it is so shaped that the jet is deflected through 120^o. Find the angle of the jet at inlet of the vane so that there is no shock. What is the absolute velocity of the jet at outlet in magnitude & direction and work done per unit weight of water? Assume the vane to be smooth. 7M

UNIT–IV

7. a) What do you mean by governing of turbines? Explain the governing of reaction turbine with neat sketch. 7M

   b) Srisailam Dam Left Bank Power Station Gross Head is 91 m and Net Head is 82.8 m. Design the Francis Turbine. Full Reservoir level is 269.75 m Tail race water level 179.8 m. (P =150MW). 7M

OR

8. a) Define Specific speed of turbine. Obtain the expression for specific speed of turbine. 7M

   b) Water turbine has velocity of 6 m/s at the entrance to the draft tube and a velocity of 1.2 m/s at exit. For frictional losses of 0.1 m and tail water 5 m below the entrance to the draft tube, find the pressure head at the entrance. 7M

UNIT–V

9. a) Define NPSH. Write the expression for NPSH. Explain limitation of suction lift. 7M

   b) The outer diameter of an impeller of a centrifugal pump is 400 mm and outlet width is 50 mm. The pump is running at 800 rpm and is working against a total head of 15 m. The vane angle at outlet is 39^o and manometric efficiency is 74%. Determine i) velocity of flow at outlet ii) velocity of water leaving the vane iii) angle made by the absolute velocity at outlet with the direction of motion at outlet and iv) discharge. 7M

OR

10. a) Explain the classification of Hydro electric power plants. 7M

    b) A Three stage centrifugal pump has impellers 37.5 cm diameter and 1.8 cm wide at outlet. The outlet vane angle is 45^o and the vanes occupy 8% of the outlet area. The manometric efficiency is 84% and the overall efficiency is 75%. What head the pump will generate when running at 900 rpm discharging 60 liters/s. What is the input power? 7M

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Hall Ticket Number :										

R-14

Code: 4GC42

II B.Tech. II Semester Supplementary Examinations May 2019

Probability and Statistics

(Common to CE, ME and IT)

Max. Marks: 70 Time: 3 Hours

PART-A

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

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UNIT–I

1. a) A Problem in statistics is given to the three students A, B and C whose chances of solving it are 1/2, 3/4 and 1/4 respectively. What is the probability that the problem will be solved if all of them try independently? 7M

   b) State and Prove Baye's theorem 7M

OR

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

x:	0	1	2	3	4	5	6	7
p(x):	0	K	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

   Find $k, P(X<6), P(X\geq 6), P(0<X<5)$ and find a value if $P(X\leq a)>\frac{1}{2}$ 7M

   b) A continuous random variable X has a probability density function $f(x)=\begin{cases}\frac{(x+1)}{2}, -1\leq x\leq 1\\ 0, \quad \text{elsewhere}\end{cases}$ represents the density of a random variable X, then find $P(X\leq 0)$, mean and variance. 7M

UNIT–II

3. a) The number of telephone lines busy at an instant of time is a binomial variate with probability 0.2. If at an instant 10 lines are chosen at random, what is the probability that (i) 5 lines are busy, (ii) at most 2 lines are busy (iii) all lines are busy 7M

   b) Fit a Poisson distribution to the frequency distribution.

x:	0	1	2	3	4
f:	122	60	15	2	1

   7M

OR

4. In a normal distribution, 7% are under 35 and 89% are under 63. Find the mean and the standard deviation of the distribution. 14M

UNIT–III

5. A population consists of the four numbers 3, 7, 11, 15. Consider all possible samples of size 2 which can be drawn with replacement from this population. Find the population mean and standard deviation, and mean and standard deviation of the sampling distribution of means. 14M

OR

6. a) A random sample of 100 factory workers in a large city revealed a mean weekly earnings of Rs. 487 with a standard deviation of Rs. 48. With what level of confidence can we assert that the average weekly salary of all factory workers in in the cit is between Rs. 472 and Rs. 502? 7M

   b) The mean and standard deviation of marks scored by a sample of 100 students are 67.45 and 2.92. Find (i) 95% and (ii) 99% confidence intervals for estimating the mean marks of the student population. 7M

UNIT–IV

7. 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 favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same, at 5% level 14M

OR

8. a) In a sample of 1,000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in the state at 1% level of significance 7M

   b) The heights of 10 males of a given locality are found to be 70, 67, 62, 68, 61, 68, 70, 64, 64, 66 inches. Is it reasonable to believe that the average height is greater than 64 inches? Test at 5% significance level assuming that for 9 degrees of freedom 7M

UNIT–V

9. The measurements of the output of two units have given the following results. Assuming that both samples have been obtained from the normal populations at 10% significant level, Test whether the two populations have the same variance

Unit-A	14.1	10.1	14.7	13.7	14.0
Unit-B	14.0	14.5	13.7	12.7	14.1

14M

OR

10. A pair of dice are thrown 360 times and the frequency of each sum is indicated below:

Sum	2	3	4	5	6	7	8	9	10	11	12
Frequency	8	24	35	37	44	65	51	42	26	14	14

Would you say that the dice are fair on the basis of the chi-square test at 0.05 level of significance? 14M

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Hall Ticket Number :										

R-14

Code: 4G643

II B.Tech. II Semester Supplementary Examinations May 2019

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. Derive an expression for a fixed beam carrying a uniformly distributed load with a given distance from one end?

OR

2. A fixed beam of span 5m carries a concentrated load of 60kN at 3.5m from the left end. If the right end sinks by 8mm find the fixing moments at the supports for the beam section. Take I=20,000cm^4 and E= 2 x 10^3 kN/cm^3. Find the reaction at the supports in addition to the fixed moments and also draw BM diagram.

UNIT–II

3. A continuous beam ABC consists of two spans AB and BC of lengths 7m and 9m. The span AB carries a point loads of 25kN at 4m from A, while the span BC carries a point load of 35kN at 5m from C. Find the moments and reactions at the supports.

OR

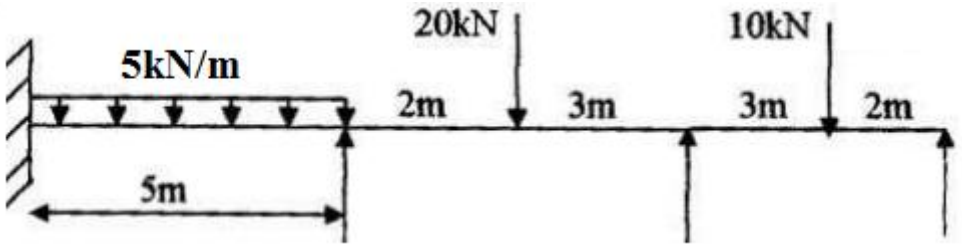
4. A continuous beam ABCD consists of three spans, AB, BC and CD of Span 3.5m each. The span AB, BC and CD loaded with 10kN, 7kN and 5kN at 0.5m, 1m and 1.5m from left support respectively. If the support B sinks by 2.5mm below the level of the other support. Find the support moments. Take I for section = 15000cm^4 and E = 2 x 10^3 kN/mm^2.

UNIT–III

5. ABC is a continuous beam with constant EI throughout its length. The end supports A and C are fixed and beam is continuous over middle support B. Span BC is uniformly loaded with 20kN per metre length, while a concentrated vertical load of 150kN acts at the mid span AB. Calculate the moments by slope deflection method.

OR

6. Draw the bending moment diagram and shear force diagram for the continuous beam shown in figure below using moment distribution method. EI is constant.



UNIT–IV

7. a) Draw the influence line diagram for a shear force at any section of a simply supported beam.

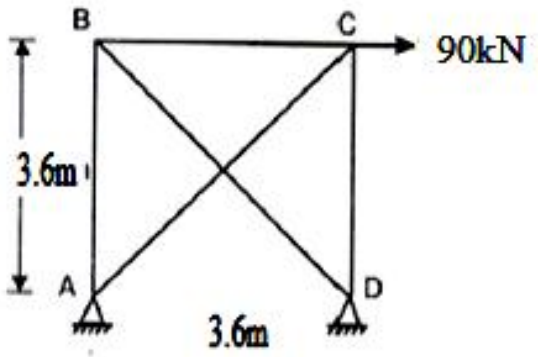
   b) A uniformly distributed load of 40kN/m acting at length of 3m transverse across the simply supported beam of length 18m.Compute the maximum bending moment at 4m from left support and absolute bending moment.

OR

8. A simply supported beam of span 8 meters is loaded with three concentrated loads of 5KN, 10KNand 15KN at a distance 2m, 4m and 6m respectively from right hand end. It also carries a uniformly distributed load of 10 kN/m throughout the span. Find position and magnitude of maximum deflection and calculate Maximum Shear Force.

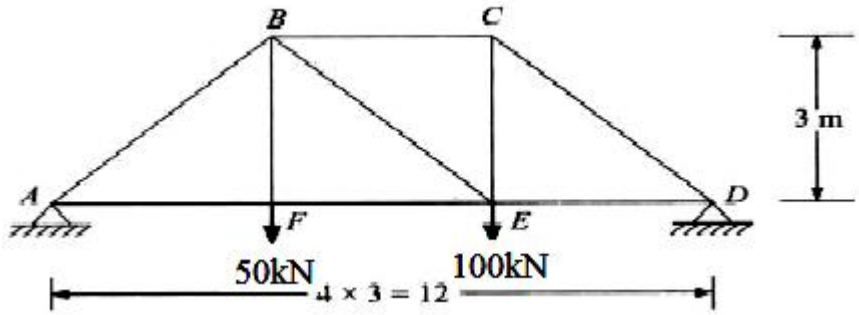
UNIT–V

9. Determine the forces in the members of the truss shown. AE (axial rigidity) is constant for all the members.



OR

10. Determine the force in the members of the truss shown in figure below. The cross sectional area of vertical and horizontal members is 4000mm^2 and that of the diagonal is 6000mm^2. Take the EI (flexural rigidity) and AE (axial rigidity) is constant for all the members.



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Hall Ticket Number :										

R-14

Code: 4G641

II B.Tech. II Semester Supplementary Examinations May 2019

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) Derive expressions for change in diameter, length and volume of a thin cylindrical shell subjected to internal pressure. 7M

   b) A compound thick cylinder is formed by shrinking a hollow cylinder of 150 mm External Diameter over another hollow cylinder of 130 mm Internal Diameter. The common diameter after shrinking is 140 mm. If the radial pressure at the junction is 120 N/mm^2 and E = 200 kN/mm^2, find the original difference in diameter of the two cylindrical shells before shrinking. 7M

OR

2. a) Derive expression for hoop stress developed in a thin spherical shell subjected to internal pressure. 7M

   b) The internal radius of a thick walled cylindrical shell is 75 mm. The internal fluid pressure in the shell is 8 N/mm^2. The maximum allowable tensile stress in the shell material is 20 N/mm^2. Find the thickness of the shell. Draw the stress distributions. 7M

UNIT–II

3. a) Derive an expression for power transmitted by a circular shaft subjected to uniform torque. 7M

   b) A laminated spring is to carry a central load of 1 kN. The spring is 90 cm long, and the width and thickness of each plate are respectively 8 cm and 1.2 cm. The bending stress in the plate material is 10 kN/cm^2. Determine the number of plates in the spring and initial deflection of the top spring. Take E= 2 X 10^4 kN/cm^2. 7M

OR

4. a) Derive an expression for shear stress induced in a close-coiled helical spring subjected to axial load. 7M

   b) A solid steel shaft of 100 mm diameter is to be replaced by a hollow steel shaft with Internal Diameter equal to half of the Outer Diameter. Design the hollow shaft and find out the percentage saving in material if the torque transmitted is the same for both the shafts. 7M

UNIT–III

5. Stating the assumptions, derive an expression for Euler's crippling load for a column with one end fixed and other end hinged. What are the limitations of Euler's formula? 14M

OR

6. Derive Secant formula. Hence deduce Perry's formula for eccentrically loaded columns. 14M

UNIT–IV

7. A concrete dam of trapezoidal section having vertical water face is 20 m high. The width of the dam is 10 m at the base and 5 m at the top. Determine
   (a) The resultant pressure on the base per metre length of the dam.
   (b) The point where the resultant pressure cuts the base.
   (c) The maximum and minimum stresses at the base.

   The height of free surface of water above the base is 15 m and specific weight of concrete is 25 kN/m^3. Take specific weight of water as 9.81 kN/m^3. 14M

OR

8. A short column of rectangular cross section 25 cm X 20 cm carries a load of 400 kN at a point 5 cm from the longer side and 10 cm from the shorter side. Determine the maximum tensile and compressive stresses in the column. 14M

UNIT–V

9. Find the centroidal principal moments of inertia of an I-section 50 mm X 4 mm top flange, 70 mm X 4 mm bottom flange, and 60 mm X 4 mm web. Also find the direction of principal axes of inertia. 14M

OR

10. A beam of T section having flange size 100 mm × 20 mm, web size 100 mm ×10 mm is 2.5 m long and is simply supported at the ends. It carries a load of 3.5KN inclined at 20^0 to the vertical and passing through the centroid of the section .If E=200 GN/m^2. Calculate (i) maximum tensile stresses, (ii) minimum compressive stresses, (iii) deflection due to load (iv) position of the neutral axis. 14M

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