Hall Ticket Number :										

Code: 4G644

R-14

II B.Tech. II Semester Supplementary Examinations May 2017

Building Planning and Drawing

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

PART-A

Answer any three units by choosing one question from each unit (3 x 14 = 42Marks)

****

UNIT–I

1. a) What is meant by building bye-law? What is the necessity of building bye-law
   b) Classify the types of buildings based on (i) Premises or Activity (ii) Design and Height

OR

2. a) Discuss the types of bye-laws and its applicability to planning the buildings
   b) Define Floor Area Ratio. How it is related to maximum ground coverage?

UNIT–II

3. a) What are the different segments required during planning of a residential building?
   b) For a low income housing, list the minimum specifications with regard to size of plot, size of rooms, FAR etc.

OR

4. a) Differentiate Residential and Non-residential buildings with suitable examples
   b) List the minimum specifications required for doorways and stairways on the basis of type of building, viz., residential and commercial.

UNIT–III

5. a) Distinguish between: (i) Activity and event (ii) Total Float and Free Float
   b) What are the essential difference between CPM and PERT

OR

6. a) A project consists of the following activities:
   Activity: 10-20,10-30,20-40,30-40,20-50,40-50
   Duration(Weeks): 13,12,2,8.15,2
   Draw the network diagram. Calculate total and free floats for the activities. Mark the critical path

PART-B

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

UNIT–IV

7. Draw to a suitable scale, the plan, elevation and vertical section of a six paneled double leaf door with a overall size of 1.2m x 2.1m.

OR

UNIT–V

8. The line plan of a residential building is as shown in Fig Q(8).

Specifications:

Foundation: 300m thick cc1:2:4 and 600 mm wide.

Basement: 300mm wide, SS masonry and 450mm above GL

Superstructure: All walls are 230mm thick BBM in CM1:6 with height above floor level 3.00m

Roof: 150mm thick RCC slab with weathering coat

Parapet wall: 100mm thick with a height of 6oomm above roof

Flooring: 20 mm thick in CM 1:3 over PCC 1:3:6, 100mm thick

Doors, windows and ventilators: As per standard specifications for a residential building along with adequate sunshades on outer walls.

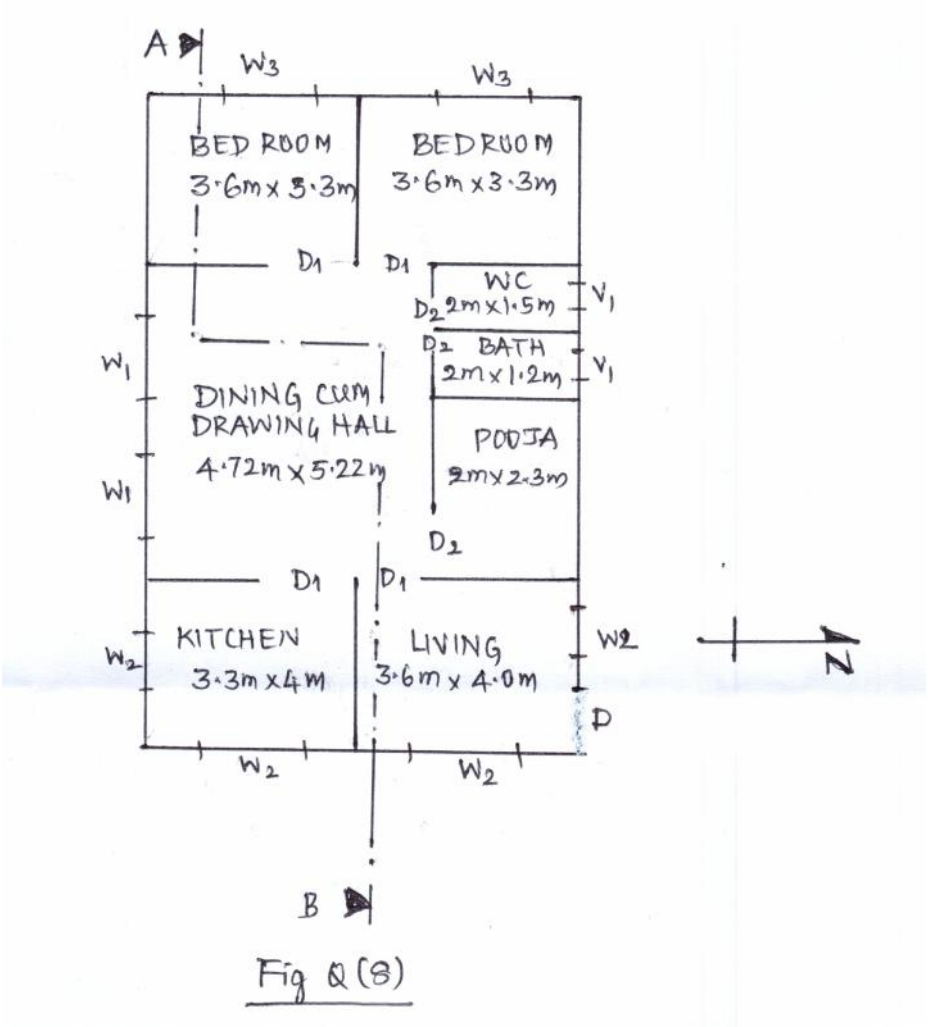


Fig Q(8)

All dimensions of rooms are clear internal dimensions

Draw: (i) Detailed PLAN (ii) Section along AB

***

Hall Ticket Number :										

R-14

Code: 4GC43

II B.Tech. II Semester Supplementary Examinations May 2017

Environmental Science

(Common to CE, ME & CSE)

Max. Marks: 70 Time: 3 Hours

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

****

UNIT–I

1. a) Discuss the various segments of environment. 7M
   b) What is the scope and importance of environmental studies? 7M

OR

2 a) Write a short note on ethics of environmental studies? 7M
   b) Describe the multidisciplinary nature of environmental studies. 7M

UNIT–II

3. a) Write about the various applications of alternative energy resources 7M
   b) Write a short note on advantages of natural resources 7M

OR

4. a) Distinguish between traditional agricultural and modern agricultural. 7M
   b) Summarize the effects of dams on forest and tribal people. 7M

UNIT–III

5. a) Write a short note on sustainable development with examples. 7M
   b) Write a short note on food chain and food web with examples. 7M

OR

6. a) What are the various threats leading to loss of biodiversity? 7M
   b) Discuss the various strategies of in-situ conservation of biodiversity 7M

UNIT–IV

7. a) What are the major effects and control measures of noise pollution? 7M
   b) What are the various methods of control to reduce water pollution? 7M

OR

8. a) Explain about causes of air pollution. 7M
   b) Explain about any two pollution case studies. 7M

UNIT–V

9. a) Write a note on global warming. 7M
   b) What are the salient provisions of Wild life Act? 7M

OR

10. a) Explain the necessity of value of environment education. 7M
    b) Explain the necessity of role of women and environment. 7M

***

Hall Ticket Number :										

Code: 4G642 **R-14**

II B.Tech. II Semester Supplementary Examinations May 2017

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)

****

UNIT–I

1. a) Differentiate the laminar and turbulent boundary layers. 4M

   b) A 1.8 m wide and 5 m long plate moves through stationary air of density 1.22 Kg/m^3 and viscosity 1.8×10^{-4} poise at a velocity of 1.75 m/s parallel to its length. Determine the drag force on one side of the plate by assuming (i) laminar flow and (ii) turbulent flow conditions. 10M

OR

2. a) Differentiate drag and lift using diagram and respective equations. 4M

   b) Assuming the shear stress distribution in a laminar boundary layer is such that $\tau = \tau_0 \left(1 - \frac{y}{\delta}\right)$
   Calculate the displacement and momentum thickness of this boundary layer in terms of δ. 10M

UNIT–II

3. a) Develop the relationship between n (Manning's coefficient), C (Chezy's coefficient), R (Hydraulic Radius) and f (Darcy-Weishbach friction factor). 3M

   b) Define hydraulically efficient channel section. Write the necessary requirements for rectangular channel section to be hydraulically efficient. 3M

   c) A trapezoidal channel with side slopes of 2 H: 1 V has to be designed to carry 15 m^3/s at a slope of 1/5000. Determine the dimensions of efficient section. Assume n=0.014. 4M

   d) Calculate the critical depth corresponding to a discharge of 6 m3/s in (i) rectangular channel of width 3 m (ii) triangular channel of side slope 1.5 H: 1 V. 4M

OR

4. a) Classify the hydraulic jumps according to Froude number. 3M

   b) Given the energy loss and Froude number after the jump as 9 m and 0.12 m respectively estimate the initial depth before the jump in a rectangular channel. 4M

   c) Water flows in a triangular channel of side slope of 1 H: 1 V and longitudinal slope of 0.001. Determine whether the channel is mild, steep or critical when a discharge of 0.2 m^3/s flows through it. Assume Manning's n=0.015. For what range of depths will the flow be on a type 1, 2 or 3 curve? 7M

UNIT–III

5. a) A jet of water moving at 20 m/s impinges on a symmetrical curved vane shaped to deflect the jet through 120^o (the vane angle at inlet and exit are 30^o). If the vane is moving at 5 m/s, find the angle of jet so that there is no shock at inlet. Also determine the absolute velocity of exit in magnitude and direction, and work done. 10M

   b) Determine the force exerted by a jet of water on a fixed flat plate in the direction of the jet. 4M

OR

6. Consider the jet striking moving symmetrical curved vane (single) at its center and derive the expression for force exerted by the jet on the vane, work done and maximum efficiency. Draw neat figures. 14M

UNIT–IV

7. a) Define Draft Tube. Write about its functions in reaction turbine using an equation and classify them. 7M

   b) A Francis turbine has an inlet diameter of 2m and an outlet diameter of 1.2m. The breadth of the blades is constant at 0.2m. The runner rotates at a speed of 250 rpm with a discharge of 8 m^3/s. The vanes are radial at inlet and the discharge is radially outwards at the outlet. Calculate the angle of guide vane at the inlet and blade angle at the outlet. 7M

OR

8. a) Compare all the three regular turbines (Pelton wheel, Francis and Kaplan). 4M

   b) Describe about Surge tanks. 3M

   c) A Francis turbine produces 6750 kW at 300 rpm under a net head of 45m with an overall efficiency of 85%. What would be revolutions per minute, discharge and brake power of the same turbine under a net head of 60m under homologous conditions? 7M

UNIT–V

9. a) Describe the various losses in pumps. 5M

   b) Describe the main and operating characteristic curves of centrifugal pump with neat sketches. 9M

OR

10. a) Define and differentiate the terms load factor, utilization factor and capacity factor. 5M

    b) Define minimum starting speed of pump. 2M

    c) A centrifugal pump delivers water against a net head of 10m at a design speed of 1000 rpm. The vanes are curved backwards and make an angle of 30^o with the tangent at the outer periphery. The impeller diameter is 30cm and has a width of 5cm at the outlet. Determine the discharge of the pump if the manometric efficiency is 95%. 7M

***

Hall Ticket Number :										

R-14

Code: 4GC42

II B.Tech. II Semester Supplementary Examinations May 2017

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)

****

UNIT–I

1. a) Define Conditional probability. State and prove Multiplication theorem of Probability. 7M

   b) A slip of paper is given to person A who marks it either with a plus sign or a minus sign, the probability of his writing a plus sign is 1/3. A passes the slip to B who may either leave it alone or change the sign before passing it to C. Next C passes the slip to D after perhaps changing the sign. Finally D passes it to a referee after perhaps changing the sign. The referee sees a plus sign on the slip. It is known that B, C and D each change the sign with probability 2/3. Find the probability that A originally wrote a plus. 7M

OR

2. a) i. The mathematical expectation of sum of n random variables is equal to the sum of their expectations, provided all the expectations exist i.e

   $X_1, X_2, \ldots\ldots\ldots X_n$ are random variables.

   $E[X_1, X_2, \ldots\ldots\ldots X_n] = E[X_1] + E[X_2] + \ldots\ldots\ldots + E[X_n]$

   ii. If X and Y are independent random variables then prove that $E[XY] = E[X]\,E[Y]$ 7M

   b) Probability density function of random variables X is ½ sinx in $0 \le x \le \pi$=0 elsewhere. Find Mean, Mode and Median for the distribution and also find the probability between 0 and $\frac{\pi}{2}$ 7M

UNIT–II

3. a) Derive Mean and Variance of Binomial Distribution. 7M

   b) Show that Poisson distribution as a limiting case of the Binomial distribution under the conditions that (i) p is very small (ii) n is very large and (iii) np = λ (say) is finite. 7M

OR

4. a) Psychological tests of Intelligence and of Engineering ability were applied to 10 students. Here is a record of ungrouped data showing Intelligence ratio (I.R) and Engineering ratio(E.R).Calculate the Coefficient of Correlation.

Student	A	B	C	D	E	F	G	H	I	J
I.R	105	104	102	101	100	99	98	96	93	92
E.R	101	103	100	98	95	96	104	92	97	94

7M

   b) The equations of two regression lines obtained in a correlation analysis are 3x + 12 y = 19, 3y + 9x = 46. Find

   (i) Coefficient of Correlation

   (ii) Mean values of X and Y

   (iii) The ratio of the coefficient of variability of X to that of Y. 7M

UNIT–III

5. a) i. A sample of size 400 is taken from a population whose standard deviation is 16. Find standard error and probable error. 7M

   ii. Define Type I and Type II errors, Null and Alternative hypothesis.

   b) A research worker wishes to estimate mean of a population by using sufficiently large sample. The probability is 95% that sample mean will not differ from the true mean by more than 25 percentage of the standard deviation. How large a sample should be taken? 7M

OR

6. a) i. A die is thrown 1536 times. An even integer obtained 1000 times. Test whether the die is unbiased.

   ii. The probability that a man aged 60 will live to be 70 is 0.6. What is the probability that out of 9 men 60 at least 6 will live to be 70? 7M

   b) A random sample of 400 men from one stage gives the mean pay of Rs 200 per day with a standard deviation of Rs 10/-. Another random sample of 400 men has a mean pay of Rs 190 per day with a standard deviation of Rs 9/-. Construct 99% confidence interval for μ_1-μ_2. 7M

UNIT–IV

7. a) The theory predicts that the proportion of beans available in four groups I, II, III, IV should be 4:3:2:6. In an experiment with 1500 beans the numbers in the four groups are 390, 305, 196, and 609. Use χ^2 test to verify whether the experiment results supports the theory. 7M

   b) Suppose that in the preceding exercise the first measurement is recorded incorrectly as 16.0 instead of 14.5. Show that now the difference between the mean of the sample is 14.7 and the average tar content by the cigarette manufacturer $\mu = 14.0$ is not significant at $\alpha = 0.05$. Explain the apparent paradox that even though the difference between sample mean and population mean has increased it is no longer significant. 7M

OR

8. a) The following are the values of skills of 2 samples with individuals 5 and 6.

Sample I	74.1	77.7	74.4	74	73.8	
Sample II	70.8	74.9	74.2	70.4	69.2	72.2

   (i) Is it possible that sample II has come from a population of mean 72?
   (ii) Test the hypothesis that the means of population of a first and second sample are equal.
   (iii) Obtain the confidence limits for the means of the population- II. 7M

   b) Explain the properties of F Distribution. 7M

UNIT–V

9. An inspection of 10 samples of size 400 each from 10 lots revealed the following number of defective units : 17,15,14,26,9,4,19,12,9,15

   Construct control limits for the number of defective units. Plot the control limits and the observations and state whether the process is under control or not. 14M

OR

10. a) Discuss about KENDALL'S Notation 7M

    b) Discuss about classification of Queing Models 7M

***

Hall Ticket Number :										

R-14

Code: 4G643

II B.Tech. II Semester Supplementary Examinations May 2017

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)

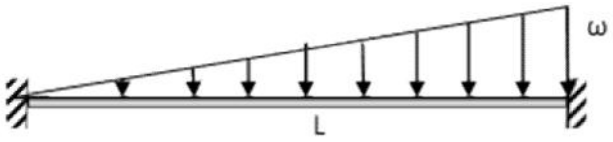
****

UNIT–I

1. A fixed beam AB of span 6 m is fixed at A and B. The beam carries a concentrated load of 28 KN at the mid span and also subjected to a UDL of 10 KN/m intensity on the left half of the span. Calculate the end moments at supports A and B and also draw the shear force and bending moment diagrams. 14M

OR

2. Determine the support moments for the fixed beam shown below



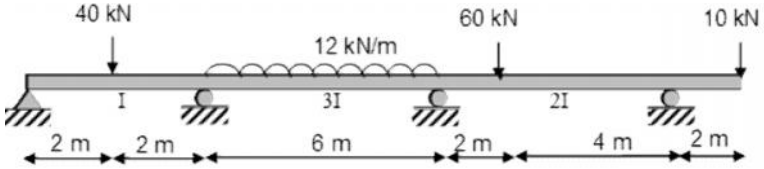
14M

UNIT–II

3. A two span continuous beam ABC rests on simple supports at A, B and C. All the three supports are at same level. The span AB=5m and span BC=4m. the span AB carries a uniformly distributed load of 15 KN/m and span BC carries a central point load of 20 KN. EI is constant for the whole beam. Find the moments and reactions at all the supports and draw the bending moment diagram using Clapeyorn's theorem of three moments. 14M

OR

4. Analyse the continuous beam shown below



14M

UNIT–III

5. A Continuous beam ABCD fixed at A and D and continuous over supports B and C. The span AB=5m carries a central concentrated load of 10KN. The span BC=4m carries a uniformly distributed load of 4 KN/m over the entire span of BC. The span CD=6m carries a non central concentrated load of 8 KN acting at a distance of 2m from the end D. Analyse the beam and draw bending moment diagram using slope deflection method. 14M

OR

6. Analyze the beam by moment distribution method. The beam at support B and C sinks by 2 mm and 7 mm. Take E = 200 KN/mm2 and I=2.5×107 mm4

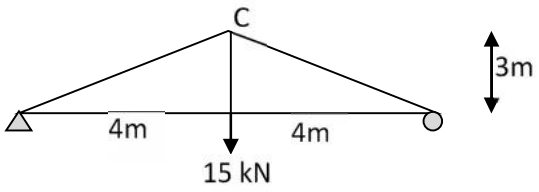
14M

UNIT–IV

7. A load of 38KN crosses a simply supported bridge of 25m span. Find the values of maximum shear force and bending moment at a section 7m and 12m from the left end support. Also calculate the absolute maximum bending moment in the bridge. 14M

OR

8. Using appropriate Castigliano's theorem determine the horizontal and vertical deflections of joint C, of the truss shown below. AE=10000 KN for all 5 members



14M

UNIT–V

9. A load of 100KN crosses a simply supported bridge of 21m span. Find the values of positive shear force, negative shear force and the bending moment at a section 12m from the left end. Using the influence lines and the maximum shear forces and find bending moment at section 12 m from the left end support. 14M

OR

10. Explain about static and kinematic indeterminacies with neat sketches 14M

***

Hall Ticket Number :										

R-14

Code: 4G641

II B.Tech. II Semester Supplementary Examinations May 2017

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)

****

UNIT–I

1. a) A boiler shell is to be made of 20 mm thick plate having a limiting tensile stress of 135 N/mm^2. If the efficiency of the longitudinal joints and circumferential joints are 80% and 40% respectively, determine the maximum permissible diameter of the shell for an internal pressure of 3 N/mm^2. 7M

   b) A thin cylindrical shell of 90 cm diameter, 1 cm thick and 4 m long is subjected to an internal pressure of 3 N/mm^2. Determine the change in length, diameter and volume of the shell. E = 2×10^5 N/mm^2, Poisson's ratio, μ = 0.3. 7M

OR

2. a) Determine the maximum and minimum hoop stress across the section of a pipe of 450 mm internal diameter and 130 mm thick, when the pipe contains a fluid at a pressure of 9 N/mm^2. Also sketch the radial pressure distribution and hoop stress distribution across the section. 7M

   b) A thick spherical shell of 230 mm internal diameter is subjected to an internal fluid pressure of 8 N/mm^2. If the permissible tensile stress in the shell material is 9 N/mm^2, find the thickness of the shell. 7M

UNIT–II

3. Derive the expression for maximum torque transmitted by a solid circular shaft. 14M

OR

4. A closely coiled helical spring of mean diameter 25 cm is made of 3.5 cm diameter rod and has 16 turns. A weight of 4 kN is dropped on this spring. Find the height by which the weight should be dropped before striking the spring so that the spring may be compressed by 20 cm. Take C = 8×10^4 N//mm^2. 14M

UNIT–III

5. Determine the ratio of buckling strengths of two columns one hollow and the other side is solid. Both are made of same material and have the same length, cross-sectional area and end conditions. The internal diameter of hollow column is half of its external diameter. 14M

OR

6. A hollow cast iron column 250 mm outside diameter and 200 mm inside diameter, 8 m long has both end fixed. It is subjected to an axial compressive load. Taking factor of safety as 6, σ_c = 570 N/mm^2, a = 1/1600. Determine the safe Rankine load. 14M

UNIT–IV

7. A short column of external diameter 45 cm and internal diameter 25 cm carries an eccentric load of 90 kN. Find the greatest eccentricity which the load can have without producing tension on the cross-section. 14M

OR

8. A short column of rectangular cross-section 85 mm by 65 mm carries a load of 50 kN at a point 25 mm from the longer side and 40 mm from the shorter side. Determine the maximum compressive and tensile stress in the section. 14M

UNIT–V

9. a) Determine the direction of neutral axis for an unsymmetrical section. 7M

   b) Determine the deflection of beams due to unsymmetrical bending. 7M

OR

10. A cantilever beam of I-section with flange size 15cm×2cm, web size 15cm×2cm and length 2m carries a load of 6 kN inclined at 30^0 to the Y- axis and passes through the centroid of the section. Calculate the maximum tensile stress, minimum compressive stress, position of neutral axis and deflection due to load. 14M

***