Hall Ticket Number :										

Code: 1G644

R-11 / R-13

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 questions from the following (3 x 14 = 42Marks)

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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
2. a) Discuss the types of bye-laws and its applicability to planning the residential buildings
   b) Define Floor Area Ratio. How it is related to maximum ground coverage?
3. 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.
4. a) Distinguish between: (i) Activity and event (ii) Total Float and Free Float
   b) What are the essential difference between CPM and PERT
5. 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 (1 x 28 = **28Marks**)

6. 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.

7. 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.

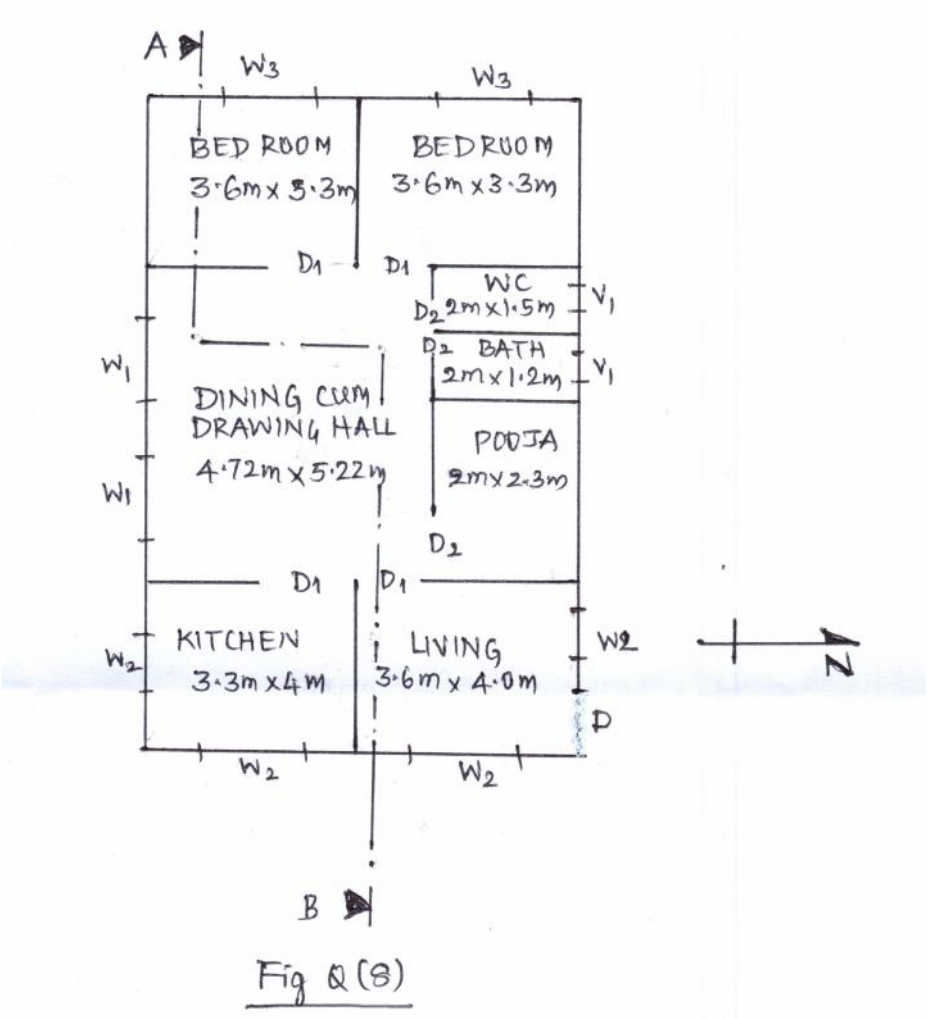

Fig Q(8)

All dimensions of rooms are clear internal dimensions

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

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Hall Ticket Number :										

R-11/R-13

Code : 1GC43

II B.Tech. II Semester Supplementary Examinations May 2017

Environmental Science

(Common to CE, ME & CSE)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)

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1. a) Define environment. List any five eminent environmentalists. 7M
   b) What are the different methods to propagate environment awareness in the society? 7M

2. a) Discuss the advantages and problems associated with dams? Give examples. 7M
   b) Comment on the different types of energy harnessed from oceans? 7M

3. a) Explain the environmental implications of mining with a case study? 7M
   b) How can you as an individual conserve different natural resources? 7M

4. a) Briefly explain the causes, effects and control measures of noise pollution? 7M
   b) Disasters are disastrous. Justify and suggest suitable management strategies? 7M

5. a) With a neat sketch, explain the functioning of hydrological cycle? 7M
   b) Discuss the salient features of an estuarine ecosystem? 7M

6. a) Define biodiversity. Classify the types of biodiversity with examples? 7M
   b) What is a hotspot? Describe the biodiversity hotspots identified in India? 7M

7. a) Discuss the impact of global warming on ecological system? 7M
   b) Explain briefly the objectives and practices of rainwater conservation. 7M

8. a) Describe the problems created by the growing population of the earth. 7M
   b) Highlight the role of information technology for environment management. 7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G642

II B.Tech. II Semester Supplementary Examinations May 2017

Hydraulics and Hydraulic Machinery

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **Five** questions
All Questions carry equal marks (**14 Marks** each)

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1. a) Explain clearly the phenomenon of boundary layer separation and how it can be prevented. 7M
   b) A kite of square shape 0.80 m side weighing 3.95 N assumes an angle of 12^0 to the horizontal. The string attached to the kite makes an angle of 45^0 to the horizontal. The pull on the string is 25 N when the wind is flowing at a speed of 30 Km/hr. Find the corresponding co-efficient of drag and lift. Specific weight of air is given as 12.26 N/m^3 7M
2. a) Explain the difference between a pipe flow and an open channel. 7M
   b) Define specific energy. Draw a neat sketch of specific energy curve for a rectangular channel if the side slopes are fixed. 7M
3. a) Derive the gradually varied flow equation $\frac{dy}{dx} = \frac{S_0 - \frac{-S_f}{Q^2 T}}{1 - \frac{g A^3}{}}$ 8M
   b) Draw the various gradually varied flow profiles 6M
4. 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 $F_x = \rho a V^2 \sin^2 \theta$, where a = area of the jet, V = velocity of the jet and θ = inclination of the plate with the jet. 7M
   b) A jet of water having a velocity of 30 m/s impinges on a series of vanes with a velocity of 15 m/s. The jet makes an angle of 30^0 to the direction of vanes when entering and leaves at an angle of 120^0. Sketch the velicity triangles at the entrance and the exit and determine the following.
      i. The angle of the vane tips so that the water enters and leaves without shock
      ii. The work done per unit weight of water entering the vanes
      iii. The efficiency 7M
5. a) Differentiate between radial and axial flow turbines 4M
   b) A conical draft tube having inlet and outlet diameters 1.25 m and 1.75 m discharges water at outlet with a velocity of 2.5 m/sec. The total length of the draft tube is 5 m and 1 m of the length is immersed in water. If the atmospheric pressure head is 10.3 m of water and loss of head due to friction in the draft tube is equal to 0.25 times the velocity head at outlet of the tube, find (**i**) Pressure head at inlet and (**ii**)Efficiency of the draft tube 10M
6. a) What is Cavitation and what are the effects of Cavitation? 7M
   b) What is governing system of a turbine and its working? 7M
7. a) What is multistage pump and what are its advantages 4M
   b) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40^0 at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm, determine: (**i**) vane angle at inlet, (**ii**) work done by impeller on water per second and (**iii**) manometric efficiency. 10M
8. a) Draw a neat sketch of hydro electric power plant with salient features 7M
   b) Explain the terms Load Factor, Utilization Factor and Capacity Factor 7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1GC42

II B.Tech. II Semester Supplementary Examinations May 2017

Probability and Statistics

(Common to CE, ME & IT)

Max. Marks: 70 Time: 3 Hours

Answer any **Five** questions
All Questions carry equal marks (**14 Marks** each)
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1. a) Find mean, median and mode from following data

X	15	25	35	45	55	65	75	85
f	5	9	13	21	20	15	8	3

7M

b) Calculate the coefficient of correlation between age of cars and annual maintenance cost

Age of cars(years)	2	4	6	7	8	10	12
Annual maintenance cost (Rupees)	1600	1500	1800	1900	1700	2100	2000

7M

2. a) Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles, with replacement being made after each draw. Find the probability that (i) both are white (ii) first is red and second is white. 7M

b) Of the three men, the chances that a Politician, a business man or an academician will be appointed as a vice-chancellor (V.C) of a University are 0.5, 0.3, 0.2 respectively. Probability that research is promoted by these persons if they are appointed as V.C are 0.3, 0.7, 0.8 respectively. Determine

(i) The probability that research is promoted.

(ii) If research is promoted, what is the probability that V.C is an academician? 7M

3. a) Find the mean and variance of the uniform probability distribution given by

$$f(x) = \frac{1}{n} \; for \; x = 1,2,3,\ldots,n$$

7M

b) A continuous random variable has the probability density function

$$f(x) = \begin{cases} kxe^{-\lambda x}, & for \; x \geq 0, \lambda > 0 \\ 0, & otherwise \end{cases}$$

Determine (i)k (ii)Mean (iii) Variance 7M

4. a) Derive mean and variance of Binomial Distribution 7M

b) If X is a normal variate with mean 30 and standard deviation 5.Find the probabilities that $(i)\ 26 \leq X \leq 40 \quad (ii)\ X \geq 45$ 7M

5. A Population consists of five numbers 2,3,6,8 and 11. Consider all possible samples of size two which can be drawn without replacement from this population. Find

(a) The mean of the population.

(b) The standard deviation of the population.

(c) The mean of the sampling distribution of means and

(d) The standard deviation of the sampling distribution of means 14M

6. a) To estimate the average time it takes to assemble a certain computer component, the industrial engineer at an electronics firm timed 40 technicians in the performance of the task, getting a mean of 12.73 minutes and a standard deviation of 2.06 minutes.
   i. What can we say with 99% confidence about the maximum error?
   ii. Use the given data to construct a 99% confidence interval. 7M

   b) In a random sample of 400 industrial accidents, it was found that 231 are due to unsafe working conditions. Construct a 99% confidence interval for the corresponding true proportions. 7M

7. a) A lady stenographer claims that she can take dictation at the rate of 118 words per minute. Can we reject her claim on the basis of 100 trials in which she demonstrates a mean of 116 words and a standard deviation of 15 words at 5% level of significance? 7M

   b) Two independent samples of 8 and 7 items respectively have the following values.

Sample-1	11	11	13	11	15	9	12	14
Sample-2	9	11	10	13	9	8	10	-

   Is the difference between the means of samples significant? 7M

8. a) In a large consignment of oranges, a random sample of 64 oranges revealed that 14 oranges were bad. Is it reasonable to ensure that 20% of the oranges are bad at 5% level of significance? 7M

   b) The following data come from a study in which random samples of the employees of three government agencies were asked about their pension plan.Use .01 level of significance to test the null hypothesis that the actual proportions of the employees favoring the pension plan are same.

	Agency-I	Agency-II	Agency-III
For the Pension Plan	67	84	109
Against the Pension Plan	33	66	41

7M

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Hall Ticket Number :										

Code : 1G643

R-11/R-13

II B.Tech. II Semester Supplementary Examinations May 2017

Structural Analysis-I

(Civil Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any* ***five*** questions

All Questions carry equal marks (**14 Marks** each)

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1 A fixed beam AB of span 7m is carrying a udl of 5 KN/m over the left half of the span and in addition there lies a point load of 6 KN at 2m from right support B. Find fixing moments and support reactions. Draw bending moment diagram and shear force diagram. 14M

2. A continuous beam ABC is fixed at A & C and is placed over a roller support at B. Span AB = 8m & BC = 6m. Span AB carries a udl of 12 KN/m & BC span is loaded with an eccentric point load of 10KN at 2m from C. Support B sinks by 10mm with respect to supports A & C. Find the moments and reactions at all supports and draw the shear force and bending moment diagrams. Assume $E = 2.1X10^5$ MPa & $I = 2.4X10^{-3}$ m^4 14M

3. A continuous beam ABCD 12m long is simply supported at A, B & C, span BC is 4m and the overhanging length CD = 2m. The span AB carries a uniformly varying triangular load varying from zero at A to 15 KN/m at B. Span BC carries a point load of 20 KN at the middle and CD is loaded with a udl of 2 KN/m. The MI of the spans AB: BC = 2I: I. Analyze the above beam using Slope – Deflection method and draw the bending moment diagram. 14M

4. A two span continuous beam ABC is fixed at A and is simply supported at C. Span AB = 6m and span BC = 6m. The beam carries a udl of 12 KN/m over both the spans. EI is constant for the whole beam. Find the support moments and reactions and sketch the beam moment diagram and shear force diagram using moment distribution method. 14M

5. A simply supported beam 4m long is struck at its middle by a weight of 3 KN falling freely from a height of 150 mm above the top of the beam. The cross-section of the beam is 120X120 mm^2. Determine the maximum central deflection of the beam using strain energy method. Assume $E = 2X10^5$ N/mm^2 . 14M

6. a) What is meant by focal length? Explain. 5M

   b) A girder of span 16 m is subjected to a dead load of 3KN/m. Calculate the portion of the girder for which the shear force changes its sign , when an equivalent uniformly distributed load of 8KN/m crosses the girder. 9M

7. A system of five loads of 8KN, 16KN, 16KN, 6KN and 4KN crosses a beam of 18m span with the 8KN load leading. The distance between the loads are 2.6m,2.5m ,2.9m and 1.8m respectively. Find also the absolute maximum BM on the beam. 14M

8. Write short notes on

   a) Strain energy due to bending moment 7M

   b) External and internal indeterminacies. 7M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G641

II B.Tech. II Semester Supplementary Examinations May 2017

Strength of Materials-II

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **Five** questions
All Questions carry equal marks (**14 Marks** each)

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1. A thin steel cylindrical shell of 10 mm thickness 1.5 m diameter and 2.75 m long is carrying a fluid at a pressure of 2.5 N/mm^2. Find the change diameter, change in length and change in volume of the cylinder. 14M

2. a) Derive a lame's formulae? 6M

   b) Draw the radial stress and hoop stress distribution across section of the pipe 400 mm internal diameter and 100 mm thick due to an internal fluid pressure of 9 N/mm^2 8M

3. A solid circular shaft is subjected to a bending moment of 300 kNm, a twisting moment of 125 kNm. If the yield stress of the shaft material is 350 N/mm^2, determine the diameter of the shaft according to the maximum shearing stress theory of failure. 14M

4. a) Differentiate between close and open coiled helical springs. 6M

   b) Derive, from fundamentals, the expression for the strain energy stored in a closed coiled helical spring subjected to an axial load 8M

5. a) Derive Euler's buckling load formula of a long column pinned at both ends. 6M

   b) A solid round bar 3 m long and 5 cm in diameter is used as a strut with one end is fixed and other is hinged. Determine the crippling load. Take E = 2x10^5 N/mm^2. 8M

6. A beam of rectangular section, 80 mm wide and 10 mm deep is subjected a bending moment of 12 KN-m. The trace of the plane of loading is included at 45o to the Y-Y axis of the section. Locate the neutral axis of the section and calculate the maximum bending stress induced in the section. 14M

7. A rectangular-sectioned beam of 75 mm x 50 mm cross-section is used as a simply supported beam and carries a uniformly distributed load of 500 N/m over a span of 3 m. The beam is supported in such a way that its long edges are inclined at 20^0 to the vertical. Determine: (a) the maximum stress set up in the cross-section: (b) the vertical deflection at mid-span. E = 208 GNlm^2 14M

8. A circular beam is supported on six equally spaced columns, and it centre line lies on a circle 6.6 m in diameter. The beam is carried uniform dead load of 9.8 KN/m and live load of 5 KN/m. Design the beam using f_c' = 27.58 MPa; f_y = 3600 MPa and b= 0.36 m 14M

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