Hall Ticket Number :										

R-11/R-13

Code : 1G644

II B.Tech. II Semester Supplementary Examinations May 2018

Building Planning and Drawing

(Civil Engineering)

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

PART-A

(Answer any THREE questions 3 X 14= 42 Marks)

1. a) Explain Building bye – laws for residential area of a town planning scheme.
   b) Explain briefly.
      (i) Setback line and its importance
      (ii) Floor space index.
      (iii) Minimum sizes for toilet and kitchen
2. Explain how you will select a site for the construction of a residential building.
3. Describe the important departments and facilities to be provided in the layout of a industry
4. a) Differentiate clearly between PERT and CPM network methods.
   b) What are the features of network planning?
5. a) Write short note on the following: Building line, Control line, Floor area ratio, Floor space index.
   b) Explain advantages and limitations of CPM.

PART-B

(Answer any ONE question on drawing sheet 1 x 28 = 28 Marks)

6. a) Draw conventional sign for the following:
   (i) Concrete. (ii) Brick. (iii) Timber. (iv) Glass.
   b) Draw to a suitable scale the front elevation of a king post truss indicating all details for a clear opening of 7500 mm
7. Draw the plan, section and elevation of a residential building with the help of data given below:
   Scale 1:50.
   (a) Living rooms with stair cap facilities to terrace - 1
   (b) Dining room – 1
   (c) Bed room with bath cum W.C – 2
   (d) Children bed room – 1
   (e) Kitchen – 1
   (f) Separate bath and W.C
   (g) Reading room – 1
   (h) Store room – 1
   (i) Open to sky
   Climate zone : Hot and humid
   Wind direction: S – SW – W
   Plinth area shall not exceed 1205 qm. Calculate the exact plinth area provided.

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Hall Ticket Number :										

R-11/R-13

Code: 1GC42

II B.Tech. II Semester Supplementary Examinations May 2018

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) Calculate the mean and standard deviation for the following

Size of item:	6	7	8	9	10	11	12
Frequency:	3	6	9	13	8	5	4

7M

b) Find the Correlation Coefficient between industrial production and export using the following data and comment on the result.

Production (in crore tons)	55	56	58	59	60	60	62
Export (in crore tons)	35	38	38	39	44	43	45

7M

2. a) Two cards are drawn at random from an ordinary deck of 52 playing cards. What is the probability of getting two aces if

i) The first card is replaced before the second card is drawn;

ii) The first card is not replaced before the second card is drawn? 6M

b) State and Prove Baye's theorem. 8M

3. a) A discrete random variable X has the following probability distribution given below:

Value of X	0	1	2	3	4	5	6	7
$P(X = x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$

(i) Find the value of 'k'. (ii) Find $P(X < 6), P(0 < X < 4)$ *and* $P(X \geq 6)$. 7M

b) Find the value of k and the distribution function $F(x)$ given the probability density function of a random variable X as: $f(x) = \frac{k}{x^2 + 1}$, $-\infty < x < \infty$. 7M

4. a) Find the mean and variance for the Poisson distribution. 7M

b) An aptitude test for selecting offers in a bank is conducted on 1000 candidates. The average score is 42 and the standard deviation of score is 24. Assuming normal distribution for the scores, find

(i) The number of candidates whose scores exceed 60;

(ii) The number of candidates whose scores lie between 30 and 60. 7M

5. A population consists of five numbers 2, 3, 6, 8 and 11. Consider all possible samples of size 2 that can be drawn with 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) Explain the following:
   i) Point estimation
   ii) Interval estimation 8M

   b) Determine a 95% confidence interval for the mean of a normal distribution with variance $\pm^2$ = 0.25 , using a sample of $n = 100$ values with mean $\bar{x} = 212.3$. 6M

7. a) Two samples of sodium vapor bulbs were tested for length of life and the following results were returned :

	Size	Sample mean	Sample S.D.
Type I	8	1234 hrs	36 hrs
Type II	7	1036 hrs	40 hrs

   Is the difference in the means significant to generalize that type I is superior to type II regarding length of life? Use a 0.05 level of significance. 7M

   b) In a random sample of 100 tube lights produced by company A, the mean life time of tube light is 1190 hours with standard deviation of 90 hours. Also in a random sample of 75 tube lights from company B the mean life time is 1230 hours with standard deviation of 120 hours. Is there a difference between the mean lifetimes of the two brands of tube lights at a significance level of 0.05? 7M

8. a) Transceivers provide wireless communication among electronic components of consumer products. Responding to a need for a fast, low-cost test of Bluetooth-capable transceivers, engineers developed a product test at the water level. In one set of trails with 60 devices selected from different wafer lots, 48 devices passed. Test the null hypothesis $p = 0.70$ against the alternative hypothesis $p > 0.70$ at the 0.95 level of significance. 6M

   b) To determine whether there really is a relationship between an employee's performances in the company's training program and his or her ultimate success in the job, the company takes a sample of 400 cases from its very extensive files and obtains the results shown in the following table:

Performance in training program					
Success in job (employer's rating)		Below Average	Average	Above Average	Total
	Poor	23	60	29	112
	Average	28	79	60	167
	Very good	9	49	63	121
	Total	60	188	152	**400**

   Use the 0.01 level of significance to test the null hypothesis that performance in the training program and success in the job are independent. 8M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G643

II B.Tech. II Semester Supplementary Examinations May 2018

Structural Analysis I

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

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

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Note: Assume any missing data suitably and mention clearly

1. A fixed beam 'AB' of span 6m carrying a UDL of 10kN/m over a span of 4m from support 'A'. A concentrated load of 20kN is acting at a distance 4m from support 'B'. Compute the fixed end moments and Draw the Shear Force Diagram (SFD) and Bending Moment Diagram (BMD). Also find the change in the fixed end moments if support 'B' sinks by 5mm. 14M

2. The loading in a continuous beam of ABCD as shown in figure 1. Analyze the beam using Clapeyron's theorem of three moments and draw SFD, BMD and Elastic curve.

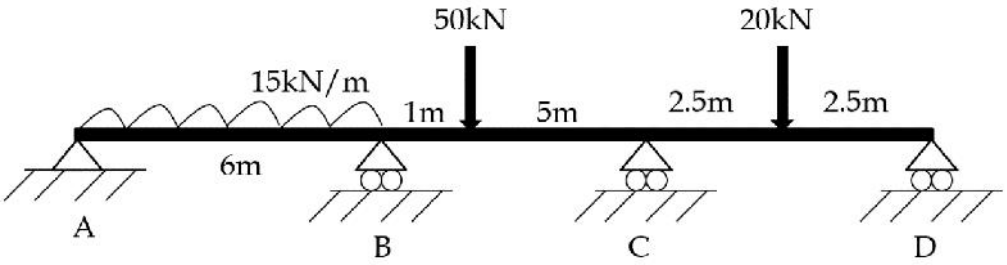

Fig. 1 14M

3. Draw bending moment diagram of a continuous beam as shown in figure 2 by using Slope deflection method. The support 'B' sinks by 5mm and support 'C' sinks by 10mm. E=200GPa and cross sectional dimensions of beam 200X300mm.

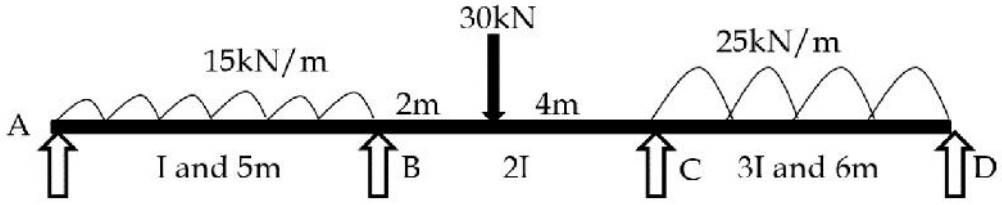

Fig. 2 14M

4. By using moment distribution method compute the fixed end moments and draw the bending moment diagram of a beam as shown in figure 3.

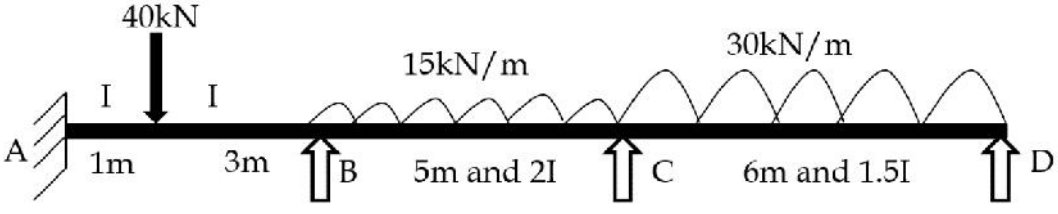

Fig. 3 14M

5. Determine the vertical displacement of both lower points C and D for the pin jointed frame shown in figure 4 by using Castigliano's first theorem. The cross sectional area of all members is 150mm^2 and the young's modulus is 2X10^5 MPa.

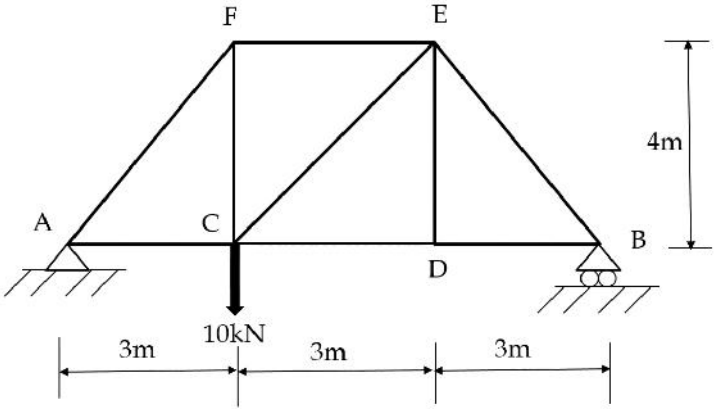

Fig. 4 14M

6. The system of concentrated loads shown in figure 5 rolls from left to right across a beam simply supported over a span of 40m, the 4kN load leading. For a section 15m from the left hand support determine (a) Maximum bending moment (b) Maximum shear force.

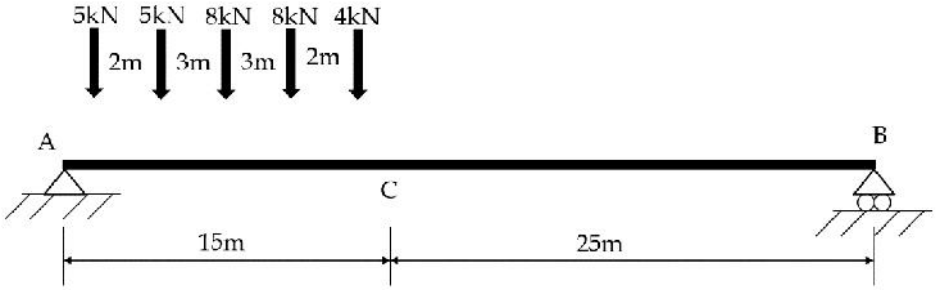

Fig. 5 14M

7. Draw the influence line diagram for the internal force of member GF of a truss as shown in figure 6 for a unit load moving along ABCD.

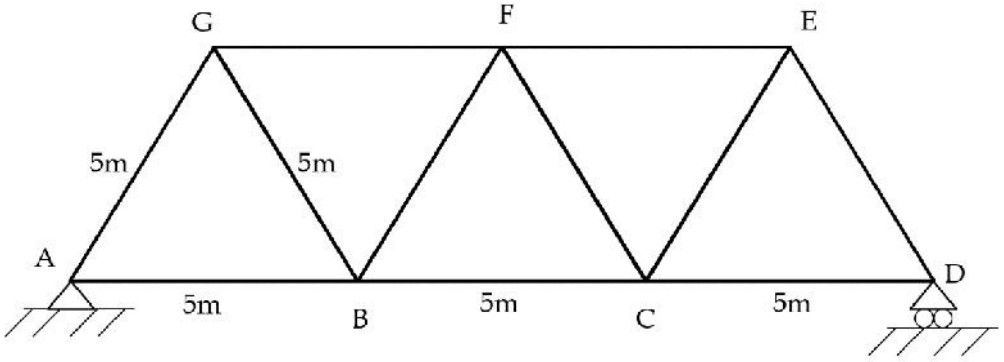

Fig. 6 14M

8. Write a short note on
   a. External and Internal Indeterminacy a truss. 5M
   b. Castigliano's Theorem. 5M
   c. Static and kinematic indeterminacy. 4M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G642

II B.Tech. II Semester Supplementary Examinations May 2018

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 the characteristics of laminar and turbulent boundary layers
   b) How will you determine whether a boundary layer flow is attached flow, detached flow (or) on the verse of separation.

2. a) What is fundamental difference between flow through pipe and flow through open channel?
   b) The base width of a trapezoidal channel section is 5M and side slopes are 1:2. The depth of water is 2.5m. Find the discharge through the channel using Chez's constant = 50. Take bed slope of the channel line 1000.

3. a) Define the hydraulic jump and explain under what circumstances it occurs.
   b) A rectangular channel of 4M width is discharging 60m^3/sec of water. Find out the critical depth and critical velocity of water flowing through the channel.

4. A water jet when strikes to a symmetrical moving blade which is moving with a velocity of 20m/sec is deflected through an angle of 150^o. The quantity of water issued through a nozzle of 25cm^2 is 0.1m^3/sec. Find the power developed and velocity of water leaving the blade.

5. a) What is turbine how can you classify the turbines
   b) A Pelton wheel is designed to develop 6MW under the head of 300m when running at 550rpm. Take D/d=10 and η_o=0.85. Find the wheel diameter, jet diameter and number of jets required and equality of water required.

6. a) What do you understand by the term specific speed? Obtain the expression for the same.
   b) A quarter – scale model of a turbine is tested under a head of 10m. A full scale turbine has to run at 420 rpm. When head available is 30m. If the model develops 100kw. When water supply 1m^3/sec. Find the speed of the model and power developed by a prototype.

7. a) State the main components of a certain fugal pump and describe the function of each.
   b) Derive the minimum speed of a centrifugal pump.

8. a) Explain the working of a double acting pump with help of neat sketch.
   b) A single acting reciprocating pump running at 100rpm delivers 12L/sec of water. The diameter and stroke of the cylinder are 20cm and 30cm respectively. Find coefficient of discharge and percentage slip.

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Hall Ticket Number :										

R-11 / R-13

Code: 1G641

II B.Tech. II Semester Supplementary Examinations May 2018

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 built up cylindrical shell of 500mm diameter, 2m long and 5mm thick is subjected to an internal pressure of 2000N/mm^2. Calculate the changes in dimensions and volume of the cylinder under that pressure, if longitudinal joint efficiency is 80% and that of circular joints is 50%. Take E= 200GN/M^2 & m=3. 14M

2. a) How are cylindrical shells classified? Explain each with respect to various stresses to which they are subjected. 7M

   b) Derive the Lame's equations to determine the stress variation in thick cylinders. 7M

3. A hollow steel shaft of 100 mm internal diameter and 150mm external diameter is to be replaced by a solid steel alloy shaft. Calculate the diameter of the solid one if the polar modulus is to remain the same. Also arrive at the ratio of their torsional rigidities. 14M

4. Design a close coiled helical spring which when subjected to 50 KN may deflect by 100 mm. The diameter of each coil is to be 12 times than that of wire of spring and the maximum shear stress is not to exceed 55 MN/ m^2 .Take C=84 GN/m^2. Also determine the value of suddenly applied load which will elongate the spring by 30mm. 14M

5. Derive Euler's critical load formula for long columns with one end fixed and the other end hinged. 14M

6. A short column of hollow rectangular section of overall dimensions 25 cm X 18 cm, the thickness being 2cms. It carries a load of 450KN in the vertical plane bisecting the 25 cm side at an eccentricity of 6 cm from the geometric axis. Calculate the maximum and minimum stress intensities in the section. 14M

7. A beam of T-Section is 4 m long and is simply supported at the ends. It carries a load of 5KN inclined at 25^o to the vertical and passing through the centroid of the section. The dimensions of the T-section are as follows: Flange-100mmX20mm.and Web-150mmX10mm. Calculate a) the max. tensile and compressive stresses b) deflection due to load and c) the position of N.A. 14M

8. A semi circular beam is supported on three equally spaced columns. Derive the expressions for maximum bending moment and maximum twisting moment from the first principles. 14M

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